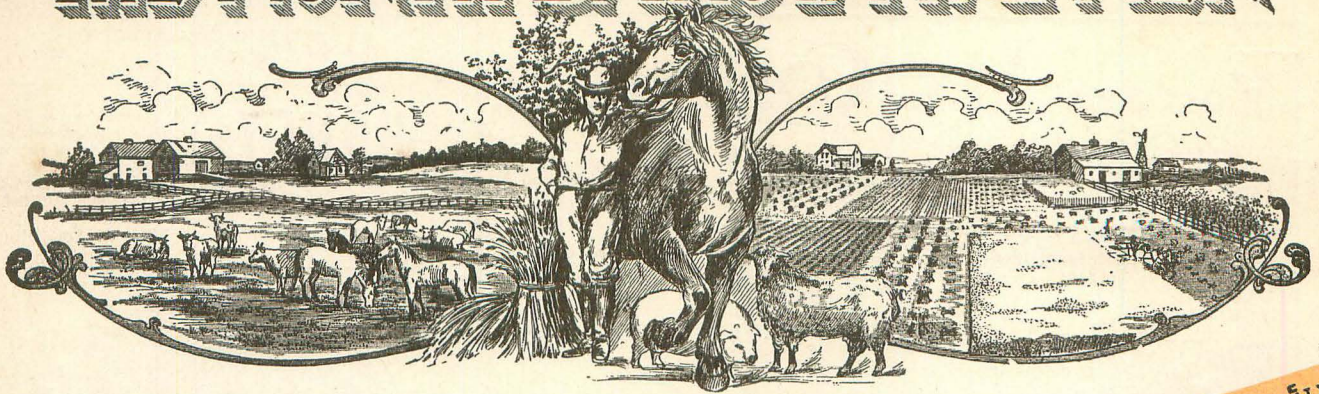


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# THE NORTH DAKOTA FARMER



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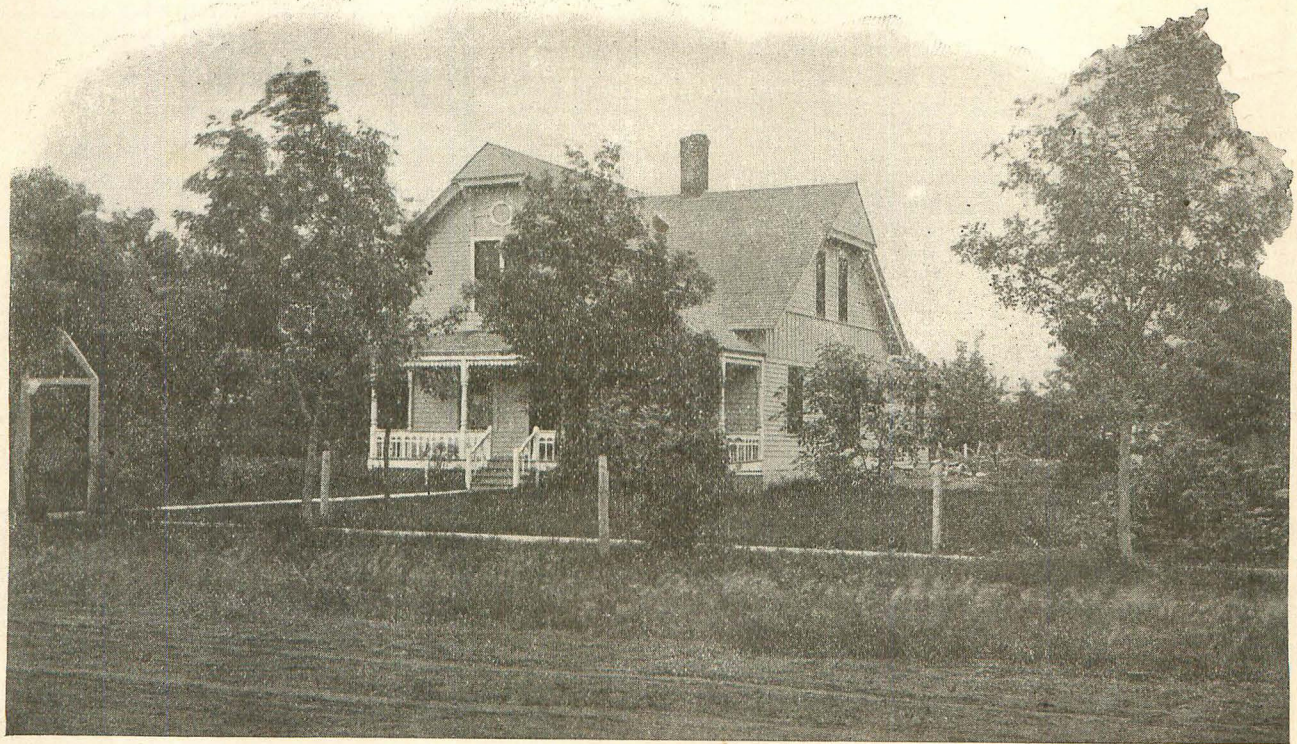
Alex Alin

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Vol. 10, No. 7  
LISBON, N. D.

JANUARY 15, 1909

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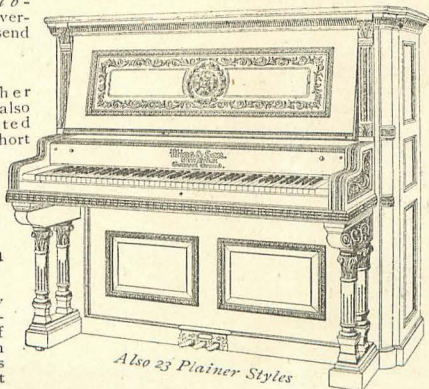
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# THE NORTH DAKOTA FARMER

Vol. 10, No. 7

LISBON and FARGO, N. D., JANUARY 15, 1909

50 Cents a Year

## OF GENERAL INTEREST

### A PLEA FOR THE STUDY OF THE SOIL

By Daniel E. Willard, Prof. of Geology,  
N. D. Agricultural College.

No sensible man will question the importance and value of the study of methods of rotation of crops in practical farming. The establishment of certain principles relating to crop succession must make possible an immense saving to the intelligent farmer by enabling him to avoid the loss from some trial which some one else has made before and found to be unsuccessful. If one crop prepares the land for another crop, and if experience has shown that certain crops prepare for certain other crops, then it is economy for the practical farmer to know these facts that he may be governed by them in planning his farm crop operations. It would seem from the most elementary reasoning that if a crop leaves a certain type of soil in an unfavorable condition for a particular crop that crop then should not be planted upon that soil until other crops or means had been used to overcome or change the unfavorable conditions. If corn following clover, and this in turn followed by wheat has been shown by experience to be a good rotation then it would seem as tho a farmer could not afford to be ignorant of such a fact. These things are too elementary to need any discussion.

But there are some principles in agricultural science that are, as it seems to me, almost as patent and clearly reasonable, which seem to receive almost no consideration by farmers,—and I was about to say by practical farmers. I am somewhat inclined to think also that their importance is not fully appreciated by professional students of agricultural science. I refer to the study of the soil.

How much attention is paid to the character of the soil in determining crop plans by the majority of farmers? How many farmers know anything of the real nature of the soils they are tilling? If excuse is offered that they have

no very sufficient means of studying the soils of their farms because so little has been published that enables them to understand the nature of soils we will grant that this is in some measure a valid excuse. But this fact, unfortunate as it may be, does not remove the necessity for the study, nor compensate for the loss sustained. Maybe the state owes it to its citizens to afford them the means of knowing the nature of the soils from which the wealth of the nation must be largely derived. Maybe the agricultural colleges owe it to the states to bring such knowledge within the reach of the people.

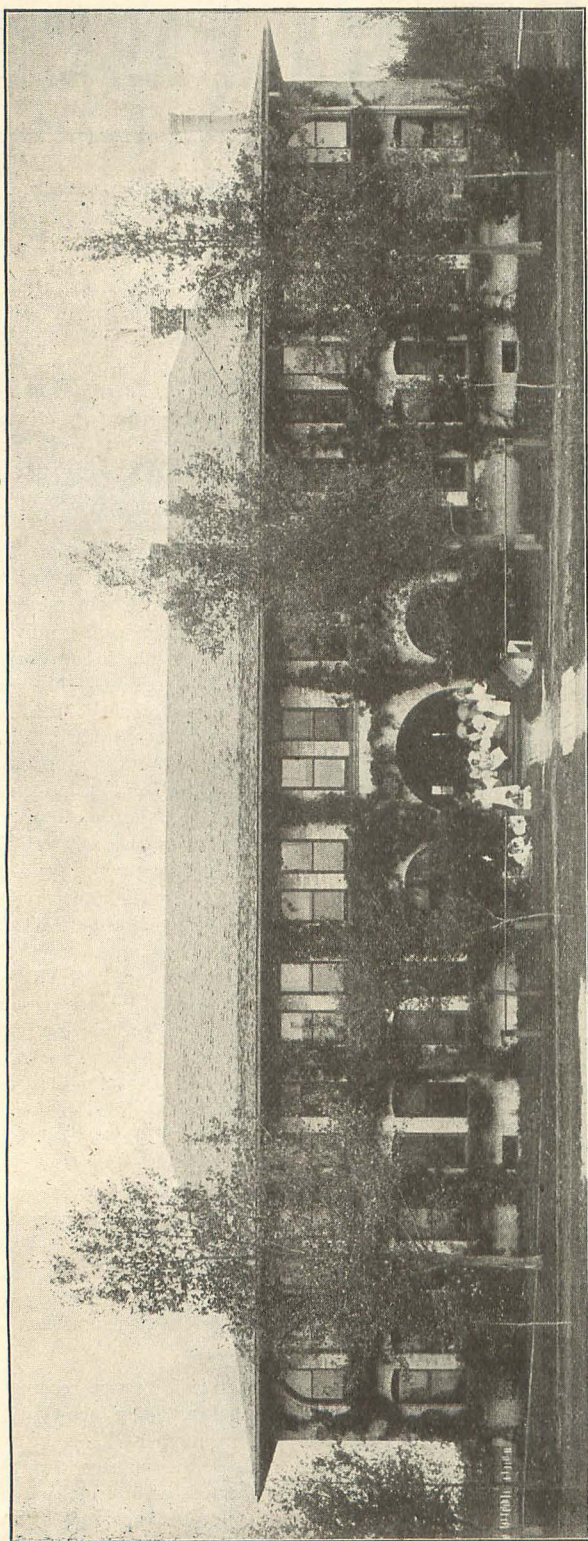
Will a plan of rotation that has been found by experience to be successful on one farm be successful on all the farms of that region? We may answer this by asking whether the soils of all the farms of that region are the same. If it is answered that they are supposed to be about the same then I will answer again by further urging the question: Are they the same? No, they probably are not. The soils of two farms that are separated only by a wire fence may be so different in character as to require for their successful cultivation quite different methods of treatment,—quite different rotations. Why? Because the structure, or texture, or composition, or maybe all of these characters, may change within a few rods. A field of a hundred acres of corn on one side of the road which divides two farms may be a profit paying crop while another hundred acres on the other side of the road, with equal cultivation and care, the same seed, and preceded by the same rotation, may represent a net loss on the balance sheet. Do not answer now that this is a draft on the imagination and probably could not be shown to be a real occurrence. You and I have seen just such cases. Visit any of the older agricultural states and see if you do not find this to be borne out by the experience of the farmers themselves.

Now, what I am desirous of discussing here is not rotation as such, for that does

not belong to my "line." That belongs in the upper story, if you please, whereas what I am contending for it is, or should be, in the foundation. I mean the proper and reasonable study of the soils. I do not mean soil physics in all or any of its applications. That again belongs to the "upper story." I do not mean agricultural chemistry. This too belongs in the upper story. I mean the study of the structure, texture, composition, and qualities of soils from the standpoint, not of physics or of chemistry, but from the standpoint of the origin of soils, their mode of formation, composition, and qualities, and the processes of which the varied types of soil are the result,—the geology of soils. This includes the mineral and organic constituents, their conditions as to solubility or the opposite under all the varying conditions both of nature and of cultivation, the availability of the substances of the soil for plant uses (I do not mean now chemically), the effects that natural and artificial conditions will bring about under the known conditions of climate, rainfall, drainage, and all the infinitely varied conditions that surround the land, the physical geology of and the processes affecting the surface formations of the earth. This is why I maintain that a geologist in such a state as North Dakota, pre-eminently an agricultural state, should be a soil specialist. This is why I maintain that a soil survey from the geological point of view should precede experiments in crop rotation. This is why I maintain that in courses of study in agricultural geology—the geological study of soils—should be given as prominent a place as other sciences.

It is for these reasons that I call attention to the fact that this subject has been neglected,—nay, has been left out altogether many times; has been neglected, or overlooked entirely, because its importance and significance have not been appreciated. The horticulturist says experiments should be made with seeds, plants, and trees, with different kinds of soil. And wisely so. He presumes,—as he has the right to presume,—that the student *has been taught* the nature of soils. The biologist pre-





Frances Hall at the Agricultural College, North Dakota, Department of Domestic Science.

sumes, consciously or unconsciously, that the student knows the character of the soils upon which his experiments are to be based. I fail to find however that opportunity is afforded to students for such study in the agricultural courses that I have examined.

What do I ask for then? I ask that the opportunity be afforded to the agricultural student to receive definite instruction in the elements of soil formation, structure, texture, composition, and qualities, from the only standpoint from which soils can be successfully studied, viz., from the standpoint of how nature made them, that is, the geological standpoint, and I ask for this opportunity **before** and **not after** the student has done his work in soil physics, soil chemistry, botany and zoology.

Let me state here that I wish to call attention to the fact that the science or study of soil physics is not the science or study of soils as such. Soils are studied in soil physics; so are pumps and pulleys studied in general physics, but I think nobody would contend that farm mechanics could be substituted for general physics because pumps and pulleys are studied in general physics. If it is contended that soil physics is the study of soils then let me ask why it might not be regarded as equally the study of physics. And if it is the study of physics then why could not soil physics be substituted for physics.

The botanist, the horticulturist, the soil physicist, the agricultural chemist, all claim that they study soils in their respective departments. Very true. I do not see how they could avoid doing so. It is because they do have to deal with problems relating directly to the soil that I claim that **soils**—and I mean soils as soils, and not soils in relation to crops or other questions—should be first studied.

Does the teacher of common school geography teach volcanoes in that subject? World geography could hardly be studied without. Will any one claim then, that the science of vulcanism is a part of geography?

A boulder in the field is a fact in geography. Will any one therefore claim that the blowpipe determination of the minerals of which that boulder is composed is a part of the science of geography?

In a course of study for (agricultural) high schools before me I find no mention of the study of soils proper, i. e., the study of soils as soils, or the geology of soils, but I do find one-half year in zoology, one-half year in botany, one-half year in soil physics, one-half year in horticulture, one-half year in animal husbandry, and mark now, there is one more half year, ten weeks of which is devoted to farm crops, and eight weeks to



soils, under these heads: formation, classification, moisture problems, drainage, irrigation, plant food (availability, etc.), fertilizers, etc.; comment upon which is I think unnecessary.

#### ALCOHOL MADE FROM FLAX STRAW

Denatured alcohol from flax straw is one of the experiments which is going to be tested out in Prof. E. F. Ladd's department at the agricultural college this winter, and if it proves a success, as is the belief of the department of agriculture at Washington, it will put to good use a large amount of flax straw which now goes to waste in North Dakota.

The department of agriculture has been making extensive experiments in denatured alcohol and has been holding a school which was attended by Mr. Morton, of the college, and the work at the institution is being conducted by him. The department has sent a special still for making the product from flax straw, to the college, and as soon as it has arrived and has been set up, this feature of the experiments will be started.

When asked what he thought of the prospects of making alcohol from flax straw, Professor Ladd said, "The department of agriculture people seem to think it will be a success altho I do not think there is enough of the right properties in the straw to make very much from it. However, that can be found out better after we have made the tests here and found out just what it will do. We will first make tests from bran and shorts and other by-products in milling and I am certain a good quality of denatured alcohol can be made from these.

In response to the question as to what he thought of the future of denatured alcohol Professor Ladd said:

"I think the future of the product in this country is very bright, altho it will take time to develop it and its practicability will depend entirely on its cost. I think that large quantities will be used in the various industries as it is now used in Germany and it should also make a good power to be used in automobiles and motors of various kinds.

"There is one thing, however, which may keep it from being practical for the farmers to manufacture it and that is that it is a technical problem and very few farmers will know exactly how to make it so that the best results may be obtained. I find that it is made extensively in Germany by the farmers but these men went to school while young and learned the brewing industry and of course had the necessary education to carry on the work intelligently.

"However this could easily become a part of the course in the agricultural colleges and the government is already planning to take the department's plant to Washington and set it up at the Seattle fair where demonstrations will be made. It is also planned that the plant be set up at several cities along the route to the fair for the purpose of giving people a chance to learn something about the manufacture of denatured alcohol.

"I believe that it will become one of the most important products of this country at some time in the future and we are going to make thoro tests at the college this winter. Our one still is already in place and I have sent to Minneapolis to one of the breweries for some of the brew as a starter for starting the bacteria in the material used for our tests here. During the winter the fermenting mash has to be kept at the proper temperature or the wrong kind of bacteria will be grown which will not make the best kind of alcohol and it is here that I think the average farmer would find trouble in making it on the farm."—*Fargo Forum.*

#### INCREASING SOIL FERTILITY

Says De Cyril Hopkins of Illinois regarding soil fertility:

In live stock farming take a five year rotation, including corn two years, oats with clover and timothy seeding the third year, and two years clover and timothy, using one year for hay and the other for pasture, assuming the same yields as before. Shock one-half of the corn or put it in the silo; husk the other half and use the oats straw for bedding.

The four crops will remove from the soil about 369 pounds of nitrogen, and the clover hay will contain about 120 pounds, which we assume was secured from the air, making 489 pounds of nitrogen in the total feed and bedding. If one-half of this is recovered in the manure and returned to the land, there would be a deficiency of 124 pounds. But two-thirds of the nitrogen can be recovered by feeding upon cement floors and a liberal use of straw and shredded fodder for bedding, thus reducing the deficiency to 43 pounds.

The pasturing may gain twelve pounds of nitrogen. By feeding more or less upon the fields and by leaving considerable clover in the pasture to serve as green manure, this small deficiency can be replaced, but to maintain or increase the supply of humus in the soil is by no means an easy problem, even with live stock farming.

Keep in mind these two words, phosphorus and humus. If these are increased in the soil the farm will be growing richer and more productive, but whoever removes the phosphorus or destroys the humus more rapidly than they are replaced will have poorer land year by year, with poverty as the only future for the children who continue the same ruinous system.

#### CHRISTMAS TREE CUSTOM UPHELD

The country's forests again have been called upon to supply about four million Christmas trees, and again many persons have asked themselves and have queried the United States Forest Service, "Is the custom a menace to the movement for forest preservation?"

In the millions of happy homes over the country where the younger generation has made the Christmas tree the center of play since early Friday morning, there are many mothers and fathers who have given the question more or less thought. From Sunday Schools and other organizations also, which hold an annual celebration around a gayly trimmed evergreen for the benefit of the little ones, has come the question whether it is consistent to urge conservation of forest resources and then to cut millions of young trees every year to afford a little joy in the passing holiday season.

"Yes, it is consistent and proper that the custom should be maintained," has been the answer of United States Forester Gifford Pinchot in every case. "Trees are for use, and there is no other use to which they could be put which would contribute so much to the joy of man as their use by the children on this one great holiday of the year.

"The number of trees cut for this use each year is utterly insignificant when compared to the consumption for other purposes for which timber is demanded. Not more than four million Christmas trees are used each year, one in every fourth family. If planted four feet apart they could be grown on less than 1,500 acres. This clearing of an area equal to a good-sized farm each Christmas should not be a subject of much worry, when it is remembered that for lumber alone it is necessary to take timber from an area of more than 100,000 acres every day of the year.

"It is true that there has been serious damage to forest growth in the cutting of Christmas trees in various sections of the country, particularly in the Adirondacks and parts of New England, but in these very sections the damage thru the cutting of young evergreens for use at Christmas is infinitesimal when compared with the loss of forest resources



thru fires and careless methods of lumbering. The proper remedy is not to stop using trees but to adopt wiser methods of use.

"It is generally realized that a certain proportion of land must always be used for forest growth, just as for other crops. Christmas trees are one form of this crop. There is no more reason for an outcry against using land to grow Christmas trees than to grow flowers."

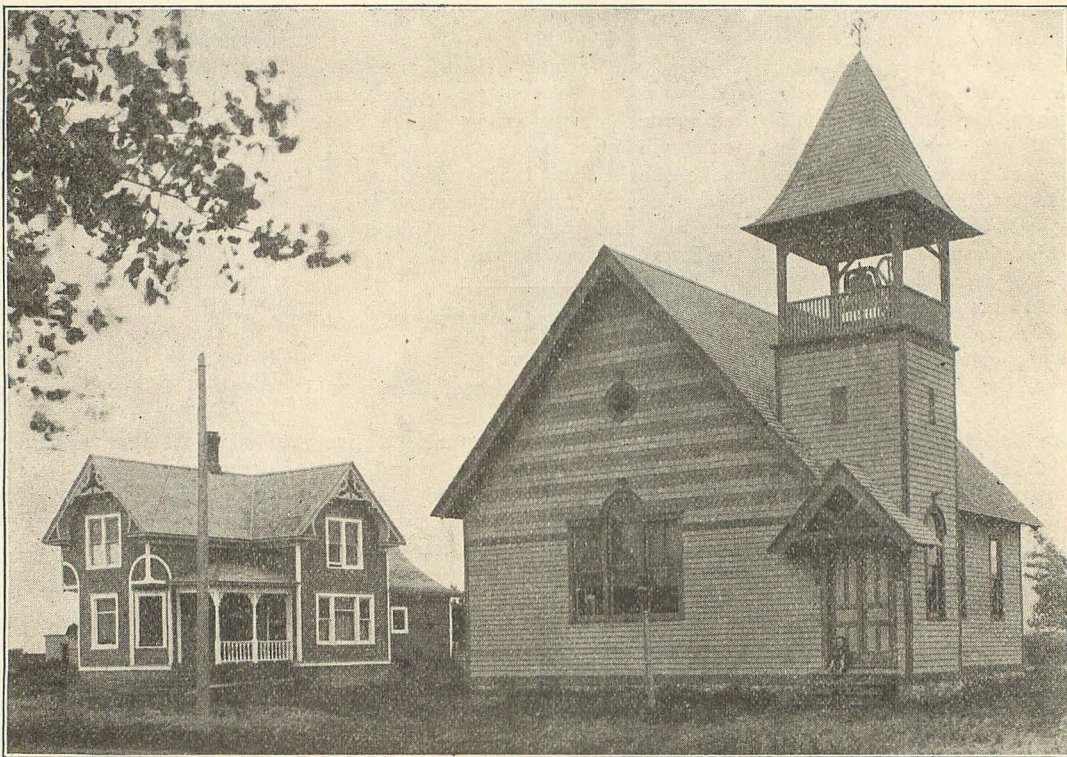
The Forest Service upholds the Christmas tree custom, but recognizes at the same time, that the indiscriminate cutting of evergreens to supply the holiday trade has produced a bad effect upon many stands of merchantable kinds of trees in different sections of the coun-

ty. capita use of Christmas trees is greatest. The cutting of small trees for Christmas is not there considered in the least as a menace to the forest, but, on the contrary, as a means of improving the forest by thinning and as a source of revenue. It is therefore constantly encouraged.

There is little doubt but that the time will come when the Christmas tree business will become a recognized industry in this country, and that as much attention will be given to it as will be given to the growing of crops of timber for other uses. This time may not be far off, for it is already understood that only thru the practice of forestry, which means both the conservation of the timber

neighborhood farmers are encouraging their boys to attend short courses, to read agricultural papers, and to secure, if possible, an agricultural education. This is the substance if not the words of the inquiry.

Our answer to this was that the viewpoint of the farmer had changed materially in the last twenty years. In fact, up to about twenty or twenty-five years ago the farmer farmed for a living. Land was rich; almost anyone could raise fair crops with any decent sort of intelligence and energy. The farm was a cheap place to live. Labor was comparatively cheap and machinery readily available. The man who could not do anything else could



Church and Parsonage at Cogswell, N. D.

try. Waste and destruction usually result when woodlands are not under a proper system of forest management. Foresters say that it is not by denying ourselves the wholesome pleasure of having a bit of nature in the home at Christmas that the problem of conserving the forests will be solved, but by learning how to use the forests wisely and properly. The ravages thru forest fires must be checked, the many avenues of waste of timber in its travel from the woods to the mill and thence to the market must be closed, and almost numberless important problems demand attention before the Christmas tree.

Germany is conceded to have the highest developed system of forest management of any country, yet its per

which remains and carefully planned systems of reforestation, will it be possible to supply the country with its forty billion feet of lumber needed each year, as well as the few million little trees used at Christmas time.

#### THE FARMER AND THE SCIENTIST

A professor in one of our agricultural colleges asked us this question the other day: Why is it that when I was a boy and wanted to secure an agricultural education my farmer friends regarded it as a very foolish notion? They did not seem to think that a farm boy could receive any possible benefit from an agricultural education; while now in the same

farm in some way, and there was no particular danger of starvation.

In the last twenty years the viewpoint has to a great extent changed. While there are still many farmers who farm for a living, or farm because they do not know how to do anything else, there are an increasing number of men who regard farming as a business in which they take more or less pride, and many of whom prefer farming to any other line of business.

Did you ever think of the meaning of the words "business man"? They were used to draw the line on the one hand between the man engaged in manufacturing or merchandising and the professional man—lawyer, preacher, doctor—and on the other hand the



farmer, who did his own work and who did not regard his occupation as requiring any particular business ability. Business men in speaking of him frequently referred to him as "only a farmer." Even this, however, was a great advance over ancient times. We suppose our readers who read their Bibles seldom read the apocryphal portion; but if they will turn to the book of Ecclesiasticus (not Ecclesiastes) and read it thru carefully they will find in it somewhere an expression like this: "How can he learn wisdom who followeth the plow; whose talk is of oxen, and who glorieth in the goad?" Evidently the farmers in those days did not stand very high even in the estimation of the preachers.

On the other hand, there has been quite as marked a change in the attitude of teachers or scientists toward the farmer. In our boyhood days no one ever thought for a moment of going to college to fit himself for farm life. In fact, farmers were wont to mourn over the boy who went to college. They felt that he was forever lost to the farm. While they had hopes for him and were frequently proud of his subsequent success, they believed that he would acquire habits and tastes which would unfit him for farm life, and that the more education he had, or was capable of getting, the less of a farmer he would be.

The idea never seemed to enter the minds of the educators of those days that an education could be obtained by the study of the science of farming quite as effective and vastly more useful than by the study of the dead languages or higher mathematics. In other words, the attitude of the scientific mind has changed quite as rapidly as the attitude of the farmer; and the farmer and the scientist are now being brought nearer together.

The farmer is beginning to understand that the scientist can be of immense help to him; that much of the progress that he now makes is due to men who knew nothing at all about practical farming, but everything about the principles which underlie it. The inventions and discoveries of scientific men have enabled farmers to control insects, rusts, and smuts, to utilize the waste of the farm in thousands of ways.

Where, for example, would dairying be if it were not for the separator and the Babcock test? How would we control the insect enemies of the corn plant without the entomologists who have laid open to us the secret of this realm of nature? We would be throwing away millions of dollars a year for commercial fertilizers if the chemists had not taught us how to use

them. We would still be looking at corn without seeing it if the corn specialists had not taught us how to study it. In short, the scientists have something to tell us now, and it is to our advantage to listen, to look in the direction they point and see for ourselves.

This fully explains why the attitude of the farmer to the book farmer, so much despised even twenty years ago, and to the scientist in his laboratory, and to the inventor in his shop, is changed. We have found that they are mighty good fellows and have something to say that is worth our attention. On the other hand, these learned gentlemen are beginning to understand that the farmer has a breadth of understanding, a capacity for comprehending principles, which their fathers and grandfathers in the scientific world would not have believed, and would not now believe if they were to visit once more the world of living men.—Wallaces' Farmer.

#### THE FEEDING OF HORSES

In selecting food for the horse we should remember the anatomical arrangement of the digestive organs, as well as the physiological functions performed by each one of them. Foods must be wholesome, clean and sweet, the hours of feeding regular, the mode of preparation found by practical experience to be the best must be adhered to, and cleanliness in preparation and administration must be observed.

The length of time occupied by stomach digestion in the horse varies with the different foods. Hay and straw pass out of the stomach much more quickly than oats. It would seem to follow, then oats should be given after hay, for if reversed the hay would cause the oats to be sent onward into the intestines before being fully acted upon by the stomach, and as a result produce indigestion. Experience confirms this. There is another good reason why hay should be given first, particularly if the horse is very hungry or if exhausted from overwork, namely, it requires more food in mastication (insuring proper admixture of saliva) and cannot be bolted, as are other grains. In either instance, water must not be given soon after feeding, as it washes or sluices the food from the stomach before it is fitted for intestinal digestion.

The stomach begins to empty itself very soon after the commencement of feeding, and several hours are required to elapse before it is entirely empty. The nature of the work required of the horse must guide us in the selection of his food. Rapid or severe labor cannot be performed on a full stomach. For such labor, food must be given in small

quantities and about two hours before they go to work. Even horses intended for slow work must never be engorged with bulky, innutritious food immediately before going to labor. The small stomach of the horse would seem to lead us to the conclusion that this animal should be fed in small quantities and often, which, in reality, should be done. The disproportion between the size of the stomach and the amount of water drunk tells us plainly that the horse should always be watered before feeding. One of the common errors of feeding, and the one that produces more digestive disorders than any other is to feed too soon after a hard day's work. This must never be done. If a horse is completely jaded, it will be found beneficial to give him an alcoholic stimulant on going into the stable. A small quantity may then be given, but his grain should be withheld for one or two hours. The same remarks will apply with equal force to the horse that for any reason has been fasting for a long time. After

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a fast, feed less than the horse would eat; for if allowed too much, the stomach becomes engorged, its walls paralyzed and "colic" is almost sure to follow. The horse should be fed three or four times a day. It will answer to feed him entirely on concreated food. A bulky food must be given to detain the grain in its passage thru the intestinal track; bulk also favors distention, and thus, mechanically, absorption. For horses that do slow work for the greater part of their time, chopped or cut hay fed with crushed oats, ground corn, etc., is the best manner of feeding, as it gives the required bulk, saves time and half the labor of feeding.

Sudden changes of diet are always dangerous. When desirous of changing the food, do so very gradually. If a horse is accustomed to oats, a sudden change to a full meal of corn will almost always sicken him. If merely intending to increase the quantity of their usual feed, this also must be done gradually. The quantity of food given must always be in proportion to the amount of labor to be performed. If a horse is to do a small amount of work, or rest entirely for a few days, see that he receives a proportionate amount of feed. If this should be observed even on Saturday night and Sunday, there would be fewer cases of "Monday morning sickness" such as colics, lymphangitis, etc.

Above all things, avoid feeding musty or mouldy foods. These are frequent causes of disease of different kinds. Lung troubles, such as bronchitis and "heaves," often follow the use of such foods. Musty hay is generally considered to produce disorder of the kidney; and all know of the dangers to pregnant animals from feeding upon ergotized grasses or grains. It has often been said to produce that peculiar disease known variously as cerebro-spinal meningitis, putrid sore throat, or choking distemper.

The best hay for horses is timothy. It should be about one year old, of a greenish color, crisp, clean, fresh, and possessing a sweet, pleasant aroma. Even this good hay, if kept for too great a length of time loses part of its nourishment, and, while it may not be positively injurious, it is hard, dry, and indigestible. New hay is difficult to digest, produces much salivation or slobbering, and occasional purging and irritation of the skin. If fed at all, it should be mixed with old hay.

The straws are not extensively fed in this country, and when used at all they should be cut and mixed with hay and ground or crushed grain. Wheat, rye and oat straw are the ones most used, and of these, oat straw is most easily digested, and contains the most nourishment. Pea and bean straws are occa-

sionally fed to horses, the pea, according to most writers, being preferable.

Wheat and rye chaff should never be used as a food for horses. The beards frequently become lodged in the mouth or throat, and are productive of more or less serious trouble. In the stomach and intestines they often serve as the nucleus of the "soft concretions" which are to be described when treating of obstructions of the digestive tract.

Oat chaff, if fed in small quantities and mixed with cut hay or corn fodder, is very much relished by horses. It is not to be given in large quantities, as I have repeatedly witnessed a troublesome and sometimes fatal diarrhoea following the practice of allowing horses or cattle free access to a pile of oat chaff.

Oats take precedence of all grains as a food for horses, as the ingredients necessary for the complete nutrition of the body exist in them in the best proportions. Oats are, besides, more easily digested and a larger proportion absorbed and converted into various tissues of the body. Care must be taken in selecting oats. According to Stewart, the best oats are one year old, plump, short, hard, clean, bright and sweet. New oats are indigestible. Oats that have sprouted or fermented are injurious, and should never be fed. Oats are to be given either whole or crushed—whole in the majority of instances; crushed to old horses and those having defective teeth. Horses that bolt their feed are also best fed upon crushed oats and out of a manger large enough to permit of spreading the grain in a thin layer.

The average horse requires, in addition to the allowance of hay above mentioned, about twelve quarts of good oats daily. The best oats are those cut about one week before being fully ripe. Not only is the grain richer in nutritive materials at this time, but there is also less waste from "scattering" than if left to become dead ripe. Mouldy oats, like hay and straw, not only produce serious digestive disorders, but have been the undoubted cause of outbreaks of that dread disease in horses, already referred to, characterized by sudden inability to eat or drink, sudden paralysis, and death.

The bran of wheat is the one most used, and its value as a feeding stuff is variously estimated. It is not to be depended upon if given alone, but may be fed with other grains. It serves to keep the bowels open. Sour bran is not to be given. It disorders the stomach and intestines and may even produce serious results.

Ground linseed is occasionally fed with other foods to keep the bowels open and to improve the condition of the skin. It is of particular service during convalescence, when the bowels are sluggish in their action. Linseed tea is often given in irritable or inflamed conditions of the digestive organs.

Carrots make a most excellent food, particularly during sickness. They improve the appetite and slightly increase the action of the bowels and kidneys. They possess also certain alterative properties. The coat becomes smooth and glossy when carrots are fed. Some veterinary writers claim that chronic



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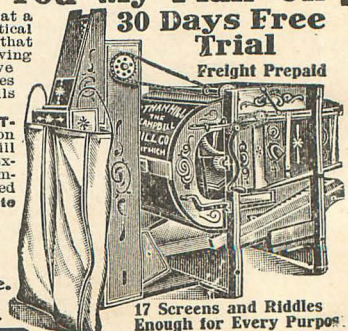
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cough is cured by giving carrots for some time. The roots, then, may be considered as an adjunct to the regular regimen, and if fed in small quantities are highly beneficial.

Foods are prepared for feeding for any of the following reasons:—To render the food more easily eaten; to make it more digestible; to economize in amount; to give it some new property, and to preserve it. We have already spoken of the preparation of drying, and need not revert to this again, as it only serves to preserve the different foods. Drying does, however, change some of the properties of food, i. e., removes the laxative tendency of most of them.

The different grains are more easily eaten when ground, crushed, or even

with such food. Bad hay should never be cut simply because it insures a greater consumption of it; bad foods are dear at any price and should never be fed. —Farmers' Advocate.

#### EXPOSITION PROGRESS UNUSUAL

Expositions have been, usually, noted for their unpreparedness on the opening day. The Alaska-Yukon-Pacific Exposition at Seattle, June 1 to October 16, 1909, will be unique and a refreshing surprise in this respect. On June 1, next, this exposition will be ready for business in fact.

On December 1, 1908, six months from the day of opening its gates, the degree of completion was as follows:

Buildings well under way: Forestry, Washington (State), Arctic Brotherhood, to be ready March 1-15, 1909.

Buildings planned and approved: Foreign, Machinery Annex, Motor Boat, Transportation, King County, Spokane County, Chehalis, Missouri, New York, Chicago, Women's, Model School, to be completed prior to May 1st.

Plans are being prepared and work will soon start on: Canadian (Government), Japan (Government), Latin-American Republics, Utah, Michigan, Athletic Stadium, Live Stock, Daughters of American Revolution, and many others of a patriotic, fraternal and special character. Many other states will also participate and erect state buildings.



Some Horses are the Envy of their Ill-Favored Neighbors.

boiled. Rye or wheat should never be given whole, and even with corn it is found that there is less waste when ground; and, in common with all grains, it is more easily digested than when fed whole.

Hay and fodder are economized when cut in short pieces. Not only will the horse eat the necessary amount in a shorter time, but it will be found that there is less waste, and the mastication of the grains (whole or crushed) fed with them is insured.

One objection to feeding cut hay mixed with ground or crushed grains and wetted, must not be overlooked during the hot months. Such food is apt to undergo fermentation if not fed directly after it is mixed, and the mixing trough even, unless frequently scalded and cleaned, becomes sour, and enough of its scrapings are given with the food to produce flatulent (wind) colic. A small amount of salt should always be mixed

The grading, installation of sewers, water, steam, telephone, and electric conduits, gas, subways and all underground works are done. Paving with asphalt well under way—10,000 square yards now laid—will be completed by April 15, 1909. Landscaping under the direction of Olmsted Bros., of Brookline, Mass., proceeding rapidly, and will be done before June 1.

Service buildings completed and occupied: Emergency Hospital, Fire Station, Power Plant, and Administration Building.

Exhibit and other buildings completed and ready for occupancy: Agriculture, Manufactures, Machinery, Oregon (State), Mining, Auditorium buildings.

Exhibit buildings more than 75 per cent done: Fisheries, Fine Arts, California (State). These will be completed by Jan. 15, 1909.

Contracts let for United States Government group of four buildings covering an area of 178,000 square feet; appropriation \$600,000; bonded for completion by May 1.

#### Ornamental Features

The Cascades and Artificial Geyser basin are practically completed; the Band Stands, Statuary and Monuments, Gates and Entrances, Subways and Bridges are well under way and will be ready Feb. 15 to April 1, 1909.

#### Concessions

A large number of leading concessionaires have made contracts and are erecting buildings on the Pay Streak. This will be the best located and finest amusement street provided by any exposition in this country. Demands for space have been so great that the exposition authorities have been able to discriminate and accept only live and especially attractive features.



Generally speaking, all necessary work is progressing as fast as is desirable, the bonds of the Exposition company, amounting to \$350,000, have been sold, and the finances are in shape to complete the plans up to the opening, June 1, 1909.

The concessions are greater in number and variety than expected, the receipts from same very satisfactory, and there is a strong feeling of enthusiasm among all the workers that the Exposition will be beautiful in appearance and successful in exhibits. The interest shown seems a certain indication of a large attendance. In fact, there is nothing now that can prove an obstacle to its success except some unusual interference impossible to foresee.

A very elaborate and expensive program of entertainments after the Exposition opens and one that will prove very attractive and interesting is being arranged.

This Exposition will be remembered, among other things, as the one that was ready and complete on its opening day. The site readily lends itself to embellishment, has the most delightful location, and is surrounded by magnificent and inspiring mountain and water scenery.

#### DISCING FOR WHEAT

"Is it a good plan to plant wheat on flax stubble with discing and dragging as the only preparation for wheat seed? This is the method in general use in our community, and I should like to know if it is the best one."

Bismarck. Mr. A. P. B.

Answered by Prof. Shepperd

Ground must be very clean indeed and inclined to be loose to the extent of drifting and being droughty from its looseness for it to be advisable to disc and drag flax stubble as the only preparation for seeding wheat. In some portions of this state the ground tends to be too loose for moisture to move thru it properly by capillarity, and at the same time allows the air to pass thru it so readily as to dry it out too much. With such soils some precaution must be taken to keep them from becoming too loose. Some form of roller, such as the sub-surface packer has proven very serviceable upon the Edgeley soils, for example. Upon some of the light soils of the state they have trouble from drifting and blowing in addition to this tendency of the ground to be loose. The simple matter of having the surface slightly covered with such material as potato stalks of the previous season will prevent it from blowing.

The incorporation of decayed vegetable matter in the form of stable manure or green crops which have been plowed

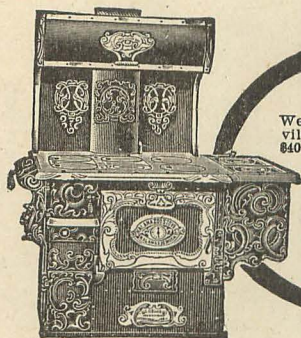
under form a common method of preventing these soils from causing trouble from blowing. Where land is weedy the discing and harrowing of flax stubble will seldom give the wheat crop an even chance with the weed growth and hence reduces the yield which can be secured. Where land does not blow, it is very much more profitable to plow the flax stubble in the fall for a wheat crop to follow it. Where it does blow, I would prefer under ordinary circumstances to plow it in the spring rather shallow, seed my crop and prevent the blowing by a light covering of thinly spread stable manure.

I believe this is as definite a statement as I can make to your correspondent.

#### TEMPERATURE OF THE SOIL

The temperature of the soil, no less than its moisture and chemical consti-

tuents, exercises an influence on its crop growing capacity. Among the advantages derived from the use of farmyard manure is the warmth it imparts to the soil, as well as the increased retention of moisture. A series of useful experiments have recently been carried out with the view of ascertaining the difference of the temperature in cultivated and uncultivated soils. The results indicate that ploughing and fallowing promote a more rapid exchange of temperature. Both the rise and fall of temperature were found to be considerably greater in the ploughed and mellowed soil than in the unploughed land, the difference between the mean temperatures of the two during the summer weather reaching two degrees, and between the extreme maximum temperatures five and more degrees. On the other hand, the minimum temperatures were lower on the ploughed land than on unploughed by almost one degree.—Exchange.



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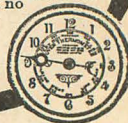
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**"THE AGRICULTURAL OUTLOOK" DELIVERED BEFORE THE CONVENTION OF GRAIN AND STOCK GROWERS OF 1909  
BY PRESIDENT J. H. WORST**

But little more than a quarter of a century has elapsed since agriculture obtained a foothold in North Dakota. The remarkable yields of wheat that followed its introduction encouraged thousands of farmers to cast their lot upon the fertile Red River lands, with little or no thought of diversified farming. The belief prevailed that the fertility of the soil was inexhaustible and the brief season of activity required to produce, harvest and market a crop of spring wheat made that sort of farming a most fascinating as well profitable vocation.

The Red River valley settled up rapidly with wheat farmers, after which immigration pushed on westward, finally reaching the limits of the state. Aside from the cattle and sheep industry, which occupied for a considerable period of time the western and dryer sections of the state, wheat became the money crop of all farming communities, until even the ranch country finally succumbed to the enterprising homesteader. And now where a few brief years since there roamed countless herds of cattle and flocks of sheep may be seen great fields of wheat and flax. The latter proved an excellent sod crop and the homesteader on the western prairies often realized a handsome income the first year from flax, as preliminary to a wheat crop the following season.

**Number One Hard Wheat.**

The quality of the wheat grown in western Minnesota and the Dakotas, as well as the large yields, became world famous. It became known as the region of number one hard, and the excellence of the flour this wheat produced insured for it a market at home and abroad at prices that made wheat growing exceedingly profitable.

Wheat still remains our chief agricultural product. It should, in the very nature of things, continue our chief product for many years to come. The world wants bread and must have it in ever increasing quantities as our own and the rest of the world's population increases. The wheat producing area cannot be greatly enlarged though our population may be doubled or trebled within the present century.

**Mixing Wheat Did Damage**

Two clouds, however, have come between the wheat grower and the unbounded prosperity that erstwhile filled his dreams. The practice of mixing a large percentage of soft southern grown wheat with our hard spring wheat, so industriously indulged in by the eastern millers, has had the effect of injuring the reputation of our hard spring wheat flour in the markets of the world. In consequence our flour does not sell on its merits, being degraded by the admixture of inferior milling wheats, to our loss and the miller's gain. The bleaching process so generally resorted to, aside from its injurious effects upon the flour, and the stomachs of the consumers, affords a convenient method of covering up the fraud. This cloud, however, can be soon dissipated by legislation, by force of public opinion, or better still by milling our wheat at home and selling the flour direct to the consumer.

Soil Not Inexhaustible

The other cloud is more serious. It is the discovered fact that our soil is not inexhaustible; that like most other soils it becomes impaired with use and unless its fertility be restored from time to time and the farming operations carried on in a workmanlike manner it refuses to produce profitable crops of wheat. The grade also declines as well as the yield. But little No. 1 hard wheat is now grown where once it was famous, and the yield per acre has fallen to about an average of thirteen bushels. The nightly beacon of folly reflected from scores of burning strawstacks during the threshing season, giving to the air what should be consigned to the soil, spells impoverishment of soil to thousands of our best acres as surely as work without food will speedily exhaust the strongest horse. These beacon fires account for the inferior quality

and lessened yield of our famous No. 1 hard wheat.

**Exploitation Fatal**

The evil that is really overtaking our chief industry and blighting the hopes of the wheat farmer can be summed up in one word—exploitation. Nor is the present wheat farmer the only or even the chief sufferer. Before the soil is utterly robbed of its productive power he may have made his fortune and retired to enjoy his wealth, discarding the many acres he has impoverished as a school boy discards a sucked orange. This method of exploiting the virgin soil of a state for private gain, for personal advantage, squares exactly with the spirit that prompts a man to profit at the expense of his country's honor. The natural resources of a state should be considered as sacred as its civic institutions and common patriotism should forbid the wanton spoliation of either the state's integrity or its wealth producing power.

But the question naturally arises, how can the big farmer fertilize his land? What can he do with his straw except burn it in order to get rid of it? These are pertinent questions. But the fact remains that under the present practice of continuous wheat cropping and straw burning the land will soon cease to yield a profitable crop. What then? Is it wise to push a ruinous practice to absolute extremity? Does any one believe for a moment that continuous cropping to wheat without re-fertilizing the land will not end in the

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OTTO JENSON, Proprietor.



impoverishment of both the soil and the farmer? If there is such person he is entitled to a degree of faith, or stupidity, worthy of a nobler cause.

#### Experience Teaches Rotation

The experiences of other sections of the country—of other states and of other lands—can be relied upon as competent to throw light upon this agricultural dilemma. From every viewpoint and from the experience of every country where normal soil conditions prevail, continuous cropping whether to cotton, tobacco, corn or wheat resulted, in due course of time, in impoverishment of the soil and agricultural stagnation. This country is no exception. A ten-year average of only thirteen and one-half bushels per acre for the spring wheat area should be considered convincing evidence to the most skeptical that our wheat lands are on the downward trend. If any further evidence is desired it may be deduced from the fact that every five year period shows a further decline in the average yield of spring wheat.

Spring wheat must mature in from 100 to 110 days. To grow a profitable crop in this short period requires very rich soil, plentifully supplied with humus, and it must be otherwise in excellent physical condition. When the prairie sod was first broken up these conditions were all present, but a quarter of a century of continuous cropping has worked great changes. The humus and other essential elements in the form of plant food have been drawn upon so continuously and so persistently that a large average yield can no longer be produced within the short growing season. Southern Minnesota and northern Iowa had to give up growing spring wheat as a reliable crop for the reasons already cited. It is apparent that the same laws that operated in the corn belt are now felt here and will continue to operate north and west with increasing severity until the extremities of the Dakotas and Canada were reached.

(To be Continued.)

#### HERE'S A LIVE FARMER

North Dakota Farmer:

Would you kindly inform me as to the following: Can I build up my very low ground meadows in Griggs county with alsike clover? How much per acre should I seed? How much per bushel does it cost? Where can I get it?

Would you recommend my planting 20 acres of any kind of corn in this county? What kind? Where can I get it? At what probable cost per bushel?

What kind of peas to sow with oats for raising field peas for market would you recommend? How many bushels of each to the acre? Where can I get the peas and at what probable price? Can I put in such a crop with a grain drill? When should they be planted? Can I probably grow such a crop here profitably?

Wm. E. Colvin. Binford, N. D.

Answered by Prof. J. H. Shepperd.

I know of no reason why you should not be able to successfully grow Alsike

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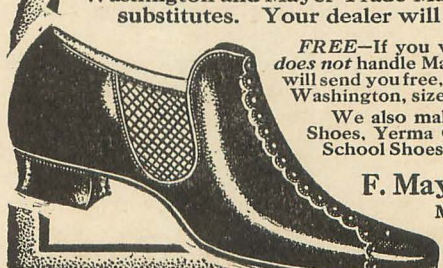
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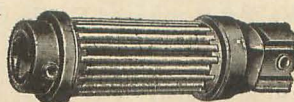
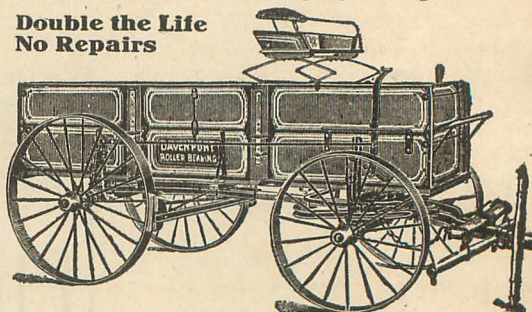
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clover in Griggs county, as you evidently know the Alsike is better adapted to moist low ground than any of the other strains of clover. It is a common practice to sow from ten to fifteen pounds of it per acre. The price per bushel varies widely and I am not able to tell you what it would be at this time. However, not less than \$7.50 per bushel and probably as high as \$10. The seed weighs 60 pounds per bushel. I know of no source of supply except the seed firms of the country.

Mercer flint corn should ripen in your part of the state and prove satisfactory seed. Triumph is also a strain which should do well in your section of the country. There are two earlier sorts known as Gehu and Will's Dakota respectively that are good yielders, but are so low growing that many people object to them on that account. Their habit of growth makes them very tedious to harvest.

If you are prepared to feed your corn, I would deem it very advisable for you to put in twenty acres, as it is a splendid preparation for small grain crops to follow.

Mercer and Triumph corn can be secured from almost any seed dealer, while Oscar H. Will and Company, Bismarck, N. D., make a specialty of Gehu and Will's Dakota, having developed them.

They will probably charge you \$3.00 per bushel for the seed.

I think that either white or yellow Canada field peas will be the most satisfactory for you to grow. Put in one and three-fourths bushels of peas and one and one-fourth bushels of oats per acre. Something will depend upon the season as to what proportion of peas and oats will grow in the crop. Peas usually cost from \$2.00 to \$3.00 per bushel. These can be seeded with a grain drill. The only objection to them is that the drill quite frequently cracks or splits them. Split peas grow but make a weaker plant. Peas should be planted as early as wheat and oats.

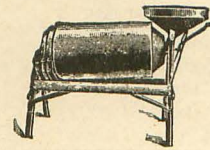
If you are prepared to feed and use the peas you produce yourself, they

should prove profitable. It is possible that you could grow them to advantage for market, altho I would not be sure of that.

I have asked that your name be placed on the mailing list to receive the bulletins and that the ones available on wheat growing be mailed to you as per your request.

## JUMBO The Greatest Grain Grader and Cleaner.

Capacity 60 bu. per hour.



Here is what you want, Mr. Farmer, if you want your seed wheat and flax cleaned and graded right, this Spring, if you want to harvest a good crop next August, you have got to get all the foul seed and especially the cockle out of the wheat.

The Jumbo will do this better than any other kind of grain cleaner. You have no doubt tried all the common fanning mills, but none have done it, nor will they do it now. Then why not try our Jumbo, it works on the right principle to do that work right, it can't be done any other way. The machine must have enough sieves to do the work on and the sieves must remain clean at all times and this is what the Jumbo does exactly and what is why the Jumbo is capable of doing the cleaning and grading to perfection. There is no better flax cleaner or timothy and clover. Those are the conditions upon which we guarantee our Jumbo, and if you want only a perfect cockle mill, order our No. 3 or No. 2 machine. They do not cost anything considering the work they do. Something no other machine can do and that is to take all the cockle out of your seed wheat.

If you are going to treat your seed grain for smut this Spring, you will save money by getting prices on our smut machine.

Write us today for our catalog and prices.

**MINNEAPOLIS SEPARATOR CO.,**  
310 Erie St. S. E.

## CASH FOR FURS

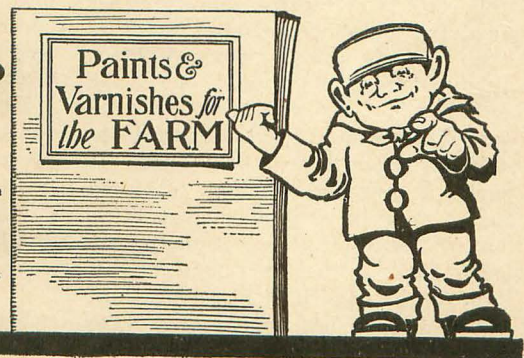


You get the highest prices and the quickest returns when you ship your furs to Funsten. We receive and sell more furs direct from trapping sections than any house in the world. The biggest American and foreign buyers are represented at our daily sales. The fierce competition among buyers enables us to get higher prices than anyone else. That's why we can send you the most money for your furs, and send it quicker. Trappers' outfits furnished at cost.

### Big Money in Trapping

While work is slack, do some trapping. It pays big profits. We send our Trapper's Guide, Fur Market Reports and Shipping Tags FREE. Write today for Catalog B and New Trapper's Guide, full of success and money-making secrets—ALL SENT FREE.  
**Funsten Bros. & Co., 298 Elm St., St. Louis, Mo.**

# Every Farmer Needs this Book



IT WILL give you much interesting and useful information on the proper selection and use of paints and varnishes for the farm. The enormous waste each year caused by the action of the elements on unprotected buildings and neglected wagons and implements is bringing about a great change in farm economics. Farmers now realize that they can preserve their houses and farm buildings from decay and add much to the life of their agricultural implements by using good paint. This little book will be sent free to any farmer who writes for it. It contains 115 pages of practical every day information about paints and painting. Write today for booklet, B-70.



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# North Dakota Farmer

## AND SANITARY HOME.

Entered as second class matter in the postoffice at  
Lisbon, North Dakota.

### PUBLISHED EVERY MONTH

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Lisbon and Fargo, N. D.

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Vol. 10 JANUARY, 1909. No. 7

### NORTH DAKOTA'S OPPORTUNITY

North Dakota is one of the great spring wheat producing sections of the country. The spring wheat grown in this state is of superior quality; richer in gluten and bread making qualities than that of any other section. Flour produced from this wheat is one of the strongest in gluten, producing one of the largest and whitest loaves of bread obtained from any flour in the country. It yields a flour not only rich in gluten and high in bread producing qualities, but it is noted for its exceptional whiteness, that is, in the patent flour.

With the passing of bleaching, then, North Dakota has an opportunity to make her influences felt not only as a great wheat raising state, but as the great flour producing region of the country. Every year our wheat should command a premium.

It is said that very little of North Dakota wheat finds its way into the eastern markets without being mixed with other wheats; that in the East the pure, unmixed North Dakota wheat is scarcely known. More of the wheat should be ground in the state and labeled to show that it is a North Dakota product. It should be shipped and sold on its merits, and the mill products used in the state in the feeding of animals, especially in the development of the dairy industry, should now become one of the important agricultural interests of the state.

With the passing of bleaching of flour, if North Dakota millers would but unite and put forth their best efforts, they

should be able to build up a magnificent business for the state. The Experiment Station and Demonstration Farms should aid in developing the best strains of wheat and disseminate the same among the farmers after the wheat has been thoroly tested at the Experimental mill and found to be of good bread producing quality.

### FREE SEED ABUSES

Why is it that Congress persists year after year in making appropriations for free seed distribution thru the Department of Agriculture at the request of Congressmen and their constituents in all parts of the United States? It has been repeatedly shown that much of the seed is worthless for the sections in which it is distributed. The writer, himself, has had a large number of samples, very few of which would grow and reach maturity in this latitude. If Congress would only appropriate half the amount of money now used for this purpose for the Department of Agriculture to assist the several Experiment Stations in the introduction of new varieties adapted to the locality, and in the improvement of old varieties, a vast amount of good would be accomplished. Under the present condition of handling this matter, it is a waste of funds; more than that, because many are misled into believing that the product is a superior one, when they would use better seed if they purchased from their local dealer.

Let us hope that Congress will take steps to make such changes as will improve conditions and be of real benefit to American agriculture.

### THE EFFECTS OF FOOD ON THE STRENGTH OF BONES

Some recent experiments, as showing the effect or influence of food on the strength of bones, have been made at the University of Nebraska and published as bulletin No. 107. The results are particularly interesting as showing what the farmers have generally contended that when animals, especially pigs, are fed upon foods deficient in mineral matter and muscle producing constituents, there is serious injury to the health of the animal and the proper development of the bone.

A number of animals were fed wholly upon corn meal, and others upon corn meal to which had been added ten per cent of bone meal, bone meal furnishing the phosphates and lime essential for the proper development of the bone.

When the various animals were slaughtered, the breaking strength of the humerus, or upper bone of the front leg, was tested in each case, and for those fed upon corn meal the strength

of bone required to break was

Pig No. 1.....930 lbs.  
Pig No. 3.....870 lbs.  
Pig No. 4.....940 lbs.

Mean.....913 lbs.

For the pigs fed upon corn meal containing ten per cent of bone meal, the breaking strength for the same bone was:

Pig No. 1.....2080 lbs.  
Pig No. 2.....2150 lbs.  
Pig No. 3.....2550 lbs.

Mean.....2093 lbs.

It will thus be seen that the bone in the fore-leg of the pigs, fed upon a ratio containing bone meal, required approximately 2.3 times as much force to break as those receiving only corn meal. The objection to feeding an exclusive diet deficient in bone and muscle producing is clearly indicated in this experiment, and the value of adding such material is clearly evident.

### FRESH EGGS

People who keep hens for the eggs they produce are beginning to realize that it pays to get a reputation for selling strictly fresh eggs.

In the long run prices would be advanced and the egg crop would bring more money if people who keep hens would provide roomy nests with clean, dry nesting material, gather eggs daily and market frequently.

In the late summer and fall, the price of eggs gradually advances, then comes the temptation to hold eggs for a few weeks, awaiting the advanced price with the result that away in November when eggs should be first class, the market is flooded with old shrunken stock, with a large percentage of rotten eggs.

We endeavor to keep separate the eggs purchased from different people until the eggs have been candled, and could some good people see the eggs they market, as we see them, they would be greatly surprised.

In order to get the top price, eggs must show freshness when placed before a strong gas light. This method will separate the day old eggs from the week old, as well as from the stale and rotten eggs.

If your eggs will stand the test you can get the top price every time.

During hot weather eggs deteriorate very rapidly. They should therefore be gathered daily and marketed frequently.

When we consider that every egg laid is a fresh egg and that with proper care it could be put before the consumer in a fresh state, it seems a pity that poor eggs should be so common.

We ask you to join us in an earnest endeavor to make the Northwest famous for the quality of eggs it markets.



**A Few Pointers in Regard to Eggs**

Furnish roomy nests with clean nesting material.

Gather eggs daily.

Market eggs at least twice each week.

Cull out small eggs.

Clean soiled eggs.

Do not keep eggs in a cellar or damp place.

Market eggs frequently.

Get a reputation for selling fresh eggs.

The above advice if followed will bring you satisfaction as well as money.

—Farm Crop.

**WHAT IS CATSUP?**

Certain manufacturers or producers of catsup seem determined to evade the spirit of the Food Law in every way possible. For years they opposed any attempt to cut out chemical preservatives, but now that they are forced to produce catsup without preservatives, we hear nothing said on this point. But the question we still have to consider is, "What is Catsup"? Shall it be any kind of a mixture that the manufacturer desires to put out under that name and labeled as tomato catsup? If you went into the market and were to buy mashed potatoes for use in the home, would you expect to be furnished, principally, the skins ground into a fine pulp, or would you expect to receive the interior of the potato with the skins excluded? We have a similar condition with regard to catsup. A catsup properly made should conform to the following definition:

"Catsup is the clean, sound product made from the properly prepared pulp of clean, sound, fresh, ripe tomatoes with spices and with or without sugar and vinegar."

This is the product as formerly made in the home and as supposed to be made by the manufacturer and offered for sale. Here is another product, labeled, likewise, Tomato Catsup, and composed of the ground up, pulverized skins and fibrous portion of tomatoes, together with glucose and the other usual constituents going to make up catsup. Shall this product be called catsup? Shall it come in competition with true catsup, or shall it be labeled so that the purchaser or consumer shall know what he is getting? In other words, is it not a compound catsup composed of tomato skins and glucose, or, a glucose catsup in accordance with the proportion of ingredients employed?

It is claimed that the food commissioners are trying to drive this class of products off from the market and force the poor man to buy only higher priced products. This is not true. All that is asked is that the product shall be labeled so that the people shall know what they are purchasing, and then

leave the public to decide for themselves.

**THE NATIONAL PURE FOOD LAW AND DR. WILEY**

No department of the Government was ever subjected to greater pressure not to do its duty than the National Pure Food Commission. The enforcement of the law necessarily interferes with nearly every branch of business; it strikes the manufacturer, wholesaler and retailer. It compels them to change the quality of their goods and the manner of packing and labeling. The change which the law requires not only destroys the business of the dishonest adulterator, but also adds to the expenses of the honest merchant and manufacturer. The reasons underlying the law are scientific and are often misunderstood by business men. The statute necessarily arouses the antagonism of all those interests. There is danger of its being destroyed before its benefits have become appreciated.

The adulteration of food has been widespread and very profitable. Those who have been long engaged in the practice feel that they have vested rights and that the law is an arbitrary interference. As a rule, they are men of high standing in the community and able to exercise political influence. This influence they are now exercising secretly upon their representatives in the Federal Government and indirectly thru the press.

Starting the law arouses more antagonism than there will ever exist again. Dr. Wiley, the chief chemist of the Agricultural Bureau, has been the most prominent officer in the enforcement of the law. He has drawn upon himself the antagonism not only of every dishonest vendor and manufacturer of food products, but also the opposition of the honest business man, who has been compelled to change his methods to meet the required conditions of the law. An organized movement covering the entire nation has been formed to secure his removal. It is not only embraces immense business interests but also has extensive support in the press. The attack is clandestine. Those who are making it, assail not the law but Dr. Wiley. They are charging that he is incompetent or arbitrary. The subject being one involving scientific knowledge and interfering with established habits, it is easy to arouse antagonism. The fact is, however, that Dr. Wiley has the entire confidence and support of scientific men who are disinterested and have the knowledge necessary to judge of his work. There are many chemists and other specialists, who are either secretly or openly in the employ of the interests, whom Dr. Wiley

has been obliged to antagonize. These hired men of science have been able to give to the opposition a force and standing which it could not otherwise have attained. At the present time they are the most dangerous enemies of the pure food and drug movement. They pretend to speak in the name of science, but are really speaking as hired retainers. Dr. Wiley has the cordial support of the disinterested men of science in our educational institutions, among the medical fraternity and among the food authorities of the country; such men as Dr. Jenkins of Connecticut, Dr. Weber of the University of Ohio, Dr. Wood of the University of Maine, Dr. Frear of Pennsylvania, Dr. Scovell of Kentucky, and a host of the other prominent workers.

It may be that Dr. Wiley has made mistakes. It would be quite impossible that such a vast, new enterprise should be organized and carried out without some mistakes. But the cardinal facts remain that Dr. Wiley is honest, fearless, intelligent and energetic.

Those who are in favor of pure food and drugs are scattered and disorganized. Individually they have no great interests at stake. On the other hand, the enemies are thoroly organized and are urged on by the hope of enormous profits. The friends of the reform should rally to the support of Dr. Wiley. He has been their defender and if he falls the law itself will suffer. While he may not need the support of the friends of the pure food movement, to show their appreciation of the work which he has done will strengthen and encourage him to continue the fight for right and justice. It will show to the officials in all the Departments of the Government that the people are interested and determined that the evils which have so long existed shall be destroyed, and that the food products supplied to the American people shall be above criticism; that the frauds which have been perpetrated upon the public in the sale of patent and proprietary products, which are worse than worthless, shall no longer be tolerated.

Reader.

**GROCERIES**

Buy at wholesale and save money. Write today for free catalog 103. GRIGGS & CO., ST. PAUL.

**"GRANT'S**

Candies are

**PURE."**



## Pure Food Advertisers

The products advertised below are in compliance with the pure food law of North Dakota and of the highest grade.  
ASK YOUR GROCER FOR THEM.

"BUY"

"EAT"

### HOME BRAND

Pure Food Products

"ECONOMY" "SATISFACTION"

Griggs, Cooper & Co.

MANUFACTURING  
WHOLESALE  
GROCERS,

ST. PAUL, MINN.

Main Offices:  
CORNER THIRD AND BROADWAY

**DR. PRICE'S**  
**JELLY**  
  
**DESSERT**  
NUTRITIOUS-WHOLESOME

One package, 10 cents, makes one pint of wholesome Fruit Jelly. All flavors from true fruits.

### "FOR THOSE WHO CARE." NOKOMIS CANNED GOODS

ARE

Selected Fruits and Vegetables.

ABSOLUTELY PURE.

Packed with Greatest Care in Sanitary Cans.

**Stone-Ordean-Wells Company,**

WHOLESALE GROCERS.

DULUTH, MINN.

MINOT, N. D.

MONARCH BRAND



FOOD PRODUCTS

A GUARANTY OF PURITY. A WELCOME GUEST at every table where the HOUSEWIFE demands the BEST. THE MONARCH LABEL insures QUALITY in Coffee, Catsup, Pickles, Maple Syrup, Canned Goods or any article bearing the MONARCH BRAND of REID MURDOCH & CO., CHICAGO.

*Libby's*

**Food  
Products**

Canned Meats Pickles Olives  
Preserves etc.

Libby, McNeill & Libby.

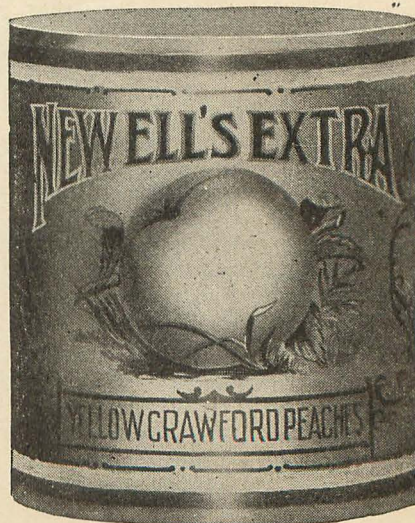
### NEWELL'S EXTRA LINE

Represents the highest quality of food products that can possibly be obtained. Purity and quantity always stand foremost.

**Geo. R. Newell & Co.,**

WHOLESALE GROCERS,

MINNEAPOLIS, - - - MINN.





## AMONG OUR ADVERTISERS.

### OF VALUE TO HORSEMEN

Do you turn your horses out for the winter? If so, we want to call your attention to a very important matter. Horses which have been used steadily at work, either on the farm or road, have quite likely had some strains whereby lameness or enlargements have been caused. Or perhaps new life is needed to be infused into their legs. Gombault's Caustic Balsam applied as per directions, just as you are turning the horse out, will be of great benefit; and this is the time when it can be used very successfully. One great advantage in using this remedy is that after it is applied it needs no care or attention, but does its work well and at a time when the horse is having a rest. Of course it can be used with equal success while horses are in the stable, but many people in turning their horses out would use Caustic Balsam if they were reminded of it, and this article is given as a reminder.

### TWO HUNDRED RECIPES FOR ENTERPRISING HOUSEKEEPERS

Every woman who prides herself upon variety and tastiness of her "table" will be interested in the new book of recipes by Helen Louise Johnson.

The important point about Miss Johnson's recipe book, which is called the "Enterprising Housekeeper," is that it contains over two hundred tested recipes calling for the use of meats, fowl and other things left over from previous meals. This book will be sent free to any woman sending her name and address to The Enterprise Mfg. Company of Pa., 236 Dauphin Street, Philadelphia.

The primary reason for distributing the cook book "Enterprising Housekeeper" is to demonstrate the possibilities of the "Enterprise" Meat and Food Chopper in the preparation of deliciously appetizing dishes that contribute both to the pleasure of the table and to economy in household maintenance.

The "Enterprise" is the only true Meat and Food Chopper that actually cuts meat so that each minute piece retains its goodness and flavor. The "Enterprise" cuts by means of a four bladed steel knife and perforated steel cutting plate that does the work thoroly.

With the "Enterprise" Chopper and the "Enterprise House keeper" the housewife is ready for guests expected or unexpected, knowing that her table will be a credit to her ability as a versatile cook and housekeeper.

### THE CHATHAM FANNING-MILL PROVES BEFORE YOU PAY

#### 30 Days' Free Trial Offer Which Should Interest Every Thinking, Thrifty Farmer

The man who is in the business of farming for business, who wants the best crops, the cleanest crops, and top-market prices is the kind of man who realizes the big advantages of owning a Chatham Fanning Mill.

He will not any longer sow seed that grows weeds and mixed crops. He knows the waste, the work, the loss that brings.

It is a low estimate to say that on a farm of any size, a Chatham Fanning Mill will pay for itself in a year's time and make a handsome per cent of profit for its owner in the bargain.

Its makers the Manson Campbell Company of Detroit, know what the Chatham will do.

They know it so well and the Chatham has proved such a friend-maker among farmers wherever introduced that they are safe in making the remarkable offer of 30 days' free trial, freight prepaid.

The Chatham will prove how perfectly it cleans all manner of crops—rice kaffir corn, maize, etc. How it separates oats from wheat perfectly; cleans red clover, takes out buckhorn, plantain, cleans alsike clover and alfalfa cleans timothy seed, takes all chess and cockle out of wheat.

Every Chatham Fanning Mill has 17 screens and riddles—enough for every cleaning and grading purpose.

The Manson Campbell Company is an old reliable concern and one which can be relied upon to carry out its agreements to the letter.

This firm has just gotten out a new, handsomely illustrated catalog, which describes the Chatham mill in detail—tells its many uses, illustrates its patented features and strong construction and proves the all-around quality of the Mill.

This is a book that every up-to-date farmer should have, and it will be mailed free for the asking. Simply drop a postal to the Manson Campbell Company, 545 Wesson Avenue, Detroit, Michigan, and the book will be sent you by first mail.

Among our new advertisers this month is the firm of John Lewis Childs, which makes a very attractive offer. Claims made by such a reliable firm are worthy of consideration. Think over the merits of their "Wonderberry."

After you have traveled by team over the prairies of this state in mid-winter,

you will appreciate the "Ferry's Handy Hame Fastener," which the N. D. F. offers for sale. Try one, and you will order more, we believe.

The Des Moines Incubator is again offered to our readers. Those who have tried this make of incubator are the loudest in its praise. Write the company for literature.

Now is the time to send for Catalog R to the Davenport Wagon Company, Davenport, Ia. You can economize in horse-flesh as well as in luxuries. Do you realize how much it adds to the expense of marketing your products by the use of an old-fashioned, hard-pulling wagon?

Eastgate Brothers of Larimore, N. D., proprietors of Willobank Farm, have some holdings that will interest those looking for White Plymouth Rocks. Why not invest part of the \$10 mentioned by Prof. Dynes in his article in Poultry section?

A Two-book Series of the North Dakota Speller has just been published. One is for the fifth and sixth years and the other is for the seventh and eighth years. Each volume sells for 15 cents. The N. D. F. has made arrangements with the publisher by which both these spellers will be mailed postpaid for one subscription at 50 cents to the N. D. F., new or renewal, provided this offer is mentioned and the subscription is sent in before April 1. This is the most practical premium ever made by any paper. Give the children a chance.

Those who spend their leisure winter hours in trapping will be delighted with the Catalog B and "Trappers' Guide" sent out free by Funston Bros. & Co. 298 Elm St. St. Louis, Mo. The inhabitants of our rivers are waiting to furnish you with spending money, besides a lot of sport.

There is a merry jingle in the words, "A Kalamazoo direct to you," but there is a merrier jingle of dollars saved by purchasing one of the stoves manufactured by the Kalamazoo Co. A postal will bring to you their Catalog 485, which will explain their manner of dealing.

Have you read the accounts of races won by motor boats having the Lackawanna installed? If you live near a body of water or expect to spend your summer on a lake shore or river, you are beginning to plan for a motor boat. Write the Lackawanna people for their "Instruction Treatise." It is a beauty. Their address is 9-29 Coldwell St. Newburgh, N. Y.



## Shade Trees and Gardens.

C. B. Waldron, N. D. A. C., Editor.

The average farmer would doubtless be willing to plant ten dollars' worth of nursery stock about his place if he knew the exact investment he could make in that line which would yield him the largest returns. It is possible to spend ten dollars with a fruit tree agent and get very little for your money. It is also possible by careful buying to obtain sufficient material to make a very good showing. Young forest trees, like the ash and elm, can be obtained in quantity for about one-half cent apiece. One dollar's worth of these placed in groups or masses at the sides and rear of the buildings will add very materially to the comfort and appearance of the place in a very short time. Young ornamental shrubs like, the lilac, snowball and spirea are easily grown and can be obtained from the nurseries at a low cost. Where one buys a large plant, of course, he must expect to pay more; but this is not necessary. Small plants, well taken care of, are usually more satisfactory than the large ones for general planting. Most nurseries have a quantity of small stock which they are glad to dispose of at prices not exceeding 10 cents per plant. It will thus be seen that with an outlay of \$10 one can supply himself with about all of the ornamental material that he will need for the average place. The secret lies in purchasing at the right price only such things as are known to be hardy and valuable, and then in planting them in groups and masses where they will grow best, and produce the best effects.

### THE GARDEN

There is an old-world saying to the effect that a man is known by his garden. This would imply that as the garden improves the man himself takes on finer and nobler qualities. This is doubtless true in greater measure than we imagine. A daily interest in things beautiful and a contact always with what is clean and orderly can have but one effect.

If one is skeptical of this and inclined to consider it moonshine, let him attend the convention of florists, horticulturists and landscape gardeners and *note the type of men that compose them.* They are men possessed of ideals and represent the character and worth of the communities they hail from. There

must be some relation between men like this and the professions in which they engage. All this may be admitted by many who for lack of knowing how, have not made the progress that their means and taste would warrant.

While it is difficult to give general directions there are a few practical points that apply to all planting. In the first place the planting of trees and shrubs as generally practiced, is too scattered for good results either on the ground of appearance or the welfare of the plants. Aside from the few shade trees planted at intervals along the drive or street all trees and shrubs should be planted in groups or masses. Trees scattered about singly not only produce no pictorial effect but they do not thrive without great effort on our part.

Most trees and shrubs thrive only in moist mellow soil and except they be planted thickly enough to shade the soil, it is difficult to keep it in this condition. A clump of trees or shrubs after three or four years requires no further attention than to cut out the plants as they become too crowded. Where single trees planted close together and cultivated or mulched between, will keep healthy and vigorous indefinitely.

Trees in mass present quite enough variety in form and color to produce artistic effects impossible with single specimens. Planted in this manner, they furnish a proper setting and background for the buildings thus relieving the bleak and naked appearance that most places possess. These masses of trees should be at the sides and rear of the place leaving the center open.

There is nothing so restful and satisfactory as a generous expanse of green-

sward untroubled by flower beds and unmolested by trees and shrubs scattered irregularly and promiscuously across its surface. If it is very large rich heavy masses of shrubs some ten or twelve feet across, they may be placed so as to break the broad view up into long narrow ones. About these and in among the shrubs flowering plants of all kinds may be placed to give color and



### THE WONDERBERRY

A Luscious Berry Ripening in Three Months from Seed.

**Luther Burbank's Greatest Creation.**

FRUIT blue-black like an enormous rich blueberry in looks and taste. Unsurpassed for eating raw, cooked, canned or preserved in any form. The greatest garden fruit ever introduced and equally valuable in hot, dry, cold or wet climates. Easiest plant in the world to grow succeeding anywhere and yielding great masses of rich fruit all summer and fall - and all winter in pots - (As a pot plant it is both ornamental and useful.) The greatest boon to the family garden ever known. Everybody can and will grow it. We are the sole producers in all parts of the world and offer thousands of dollars in cash prizes for which see Catalogue.

Seed 20c. per packet, 3 packets for 50c.

Also our Great Catalogue of Seeds, Bulbs, Plants and New Fruits for 1909, free.

JOHN LEWIS CHILDS, Floral Park, N. Y.

## Billion \$ Grass

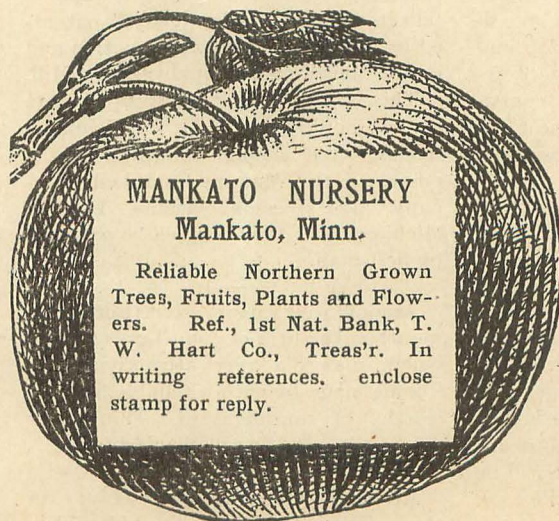
SEED COSTS BUT 90c PER ACRE

Most wonderful grass of the century, yielding from 6 to 10 tons of hay per acre and lots of pasture besides. It simply grows, grows, grows! Cut it today and in 4 weeks it looks for the mower again, and so on. Grows and flourishes luxuriantly everywhere, on every farm in America.

Big seed catalog free or send 10c in stamps and receive sample of this wonderful grass, also of Speltz, the cereal wonder, Barley, Oats, Clovers, Grasses, etc., etc., easily worth \$10.00 of any man's money to get a start, and catalog free.

Or send 14c and we add a sample farm seed novelty never seen by you before.

JOHN A. SALZER SEED CO., LaCrosse, Wis.



### MANKATO NURSERY Mankato, Minn.

Reliable Northern Grown  
Trees, Fruits, Plants and Flow-  
ers. Ref., 1st Nat. Bank, T.  
W. Hart Co., Treas'r. In  
writing references, enclose  
stamp for reply.

Save Money--READ this  
Offer. \$30.00 for \$6

20 2-year old assorted  
apple trees; 6 2-year old  
assorted plum trees; 4  
Mulberry; 2 cherry; 2  
pear; 10 evergreens; 4  
walnut; 2 Strawberry  
trees. 50 strawberries;  
25 asparagus; 10 rasp-  
berries; 10 blackberries;  
6 grapes; 6 currants.

FREE. On early or-  
ders as a premium, will  
be given 10 ass't. bulbs, 2  
mountain ash, and 4  
flowering shrubs. Write  
us.



variety. It is next to impossible to make a formal flower bed appear as a natural feature of a landscape. In practically all cases, it has a kind of out-of-place look that condemns its existence. Flowers to appear in keeping with their surroundings should be planted in a border along a hedge or about masses of shrubbery. While the lawn should be free and open it should be defined so as not to appear a part of the public domain. It should be set off from the surrounding territory by heavy belts and masses of trees planted in as natural a manner as possible.

#### PURE SEED LAW

H. L. Bolley

During the winter holidays I attended a session of the American Association for the Advancement of Science at Baltimore, Md. I also went as a delegate to a meeting of experiment station officers and seed commissioners which convened at the new agricultural building in Washington.

The sessions of this meeting were of great importance to agriculture. There were some thirty seed investigators and inspectors present at the meeting, and an organization was formed which will be known in the future as the American Association of Official Seed Analysis. The meeting was called for the purpose of bringing the different men who are doing seed control and seed inspection work in the different states together, to consult as to the best methods of promoting the interests of agriculture as affected by the seed trade. Discussions extended over the entire field of seed examination, seed testing, seed inspection, and seed control. A committee was appointed to recommend standard methods of sampling, testing, grading, etc., and another committee was ordered to work upon the possibilities of bringing about uniform action of the seed laws, as nearly as possible, in the different states.

A number of states have good laws in operation and the government reports show that the results of these laws have been very beneficial to the people of the state in which they are in operation. Maine, especially, has an effective law which has proven to be of great value to farmers and gardeners of the state and the seedsmen have improved the grade of the seed which they are selling on the market to such an extent that there is a marked improvement in the yield of the crops reported during the past four or five years, in which the law has been in operation. This is believed to be directly attributable to the beneficial action of the law as directed by the Maine experiment station. A number of other states have

been considering the adoption of laws during the present legislature session, and it was the opinion of the men there assembled that the state lagging behind in this will find themselves a dumping ground for an immense amount of worthless seed, besides large quantities of adulterants in the way of weed seeds which will in the future prove a great distress to the farmers and gardeners of the states concerned.

For example, it is shown, clearly by inspection work conducted in certain of the states and by the department of agriculture, that there are a number of firms engaged in importing dead clover and alfalfa seed and large volumes of weed seeds for the express purpose of mixing and adulterating the high grade clover seed which contained only 12 per cent of viable clover seed and a large percentage of weed seeds which are not found in the United States, including dodged and other clover pests. There were thirty-seven varieties of such weed pests in this sample of seed. This seed was imported in ton lots for the purpose of contaminating the clover and alfalfa seed of the country. A little circular of the department of agriculture shows that large quantities of the seed of Yellow Trefoil, a plant which is not grown in this country for forage, but proves to be a very troublesome weed are imported, the seed costing about 5 cents per pound. This seed is mixed in with red clover seed to sell to our farmers. The same little circular reports a number of wholesale samples of such red clover seed and gives the percentage of Trefoil which was in-

termixed in five samples. It is as follows:

- Sample 1 contained 27 per cent.
- Sample 2 contained 52 per cent.
- Sample 3 contained 45 per cent.
- Sample 4 contained 30 per cent.
- Sample 5 contained 30 per cent.
- Sample 5 contained 18 per cent.

This is only an illustration of what is being carried on by the wholesale seed trade and the local merchants and farmers are wholly at the mercy of such disreputable firms.

I am a firm believer that this state should at once have a simple but efficient seed law which would allow of proper seed sampling and testing, associated with the authority to place before the public full reports concerning the qualities of seeds that are placed on the market by the different firms. This would prove a benefit, not only to the farmers and gardeners of the state, but to the seedsmen who are dependent upon the larger seed merchants for supplies; and to the state at large thru general agricultural improvement.



6 TREES

FREE

To prove that our "Blizzard Belt Evergreens" will grow in all parts of the country we offer to send 6 fine Spruces  $\frac{1}{4}$  to  $\frac{1}{2}$  ft. tall, free to property owners. Wholesale value and mailing expense over 30 cents. To help, send 5 cents or not as you please. A postal will bring the trees and our catalog containing many colored photo plates of our choice Blizzard Belt Fruits, Ornamentals, etc. We want to get acquainted with you and it will pay you to get in touch with our Hardy Blizzard Belt trees. 39 years' experience in growing hardy trees here in what was once called the Great American Desert. Write today.

THE GARDNER NURSERY CO., Box 42, Osage, Iowa

## Trees and Seeds That Grow

For the past 23 years we have supplied our customers in all States with Trees and Seeds that grow. We carry a most complete line of **Fruit and Ornamental Trees, Berry Bushes, Roses, Perennials, Bulbs, etc.** at low prices.

Apple 7c; Plum 10c; Cherry 17c, all budded trees. Concord Grapes \$2.50 per 100. We pay freight on \$10 orders.

GERMAN NURSERIES & SEED HOUSE

CARL SONDEREGGER, Prop.

Complete stock of all kinds of **Farm, Garden and Flower Seeds** to select from. Write for our large 112 page catalog and Garden Guide. We mail same free of charge to anyone interested, also sample pkt. "May King" Lettuce, the earliest and finest of all head lettuce.

German Nurseries and Seed House  
Box 163  
Beatrice, Neb.

## Seed Seed

Write us for samples and prices on anything you want in SEEDS.

Price list mailed Free.

FARGO SEED HOUSE, - - - Fargo, N. D.



# Livestock Department

PROF. W. B. RICHARDS, Editor

## THE REGULATION OF STALLIONS OFFERED FOR PUBLIC SERVICE

Several states have passed laws regulating the public service of stallions during the last few years. These laws have proven very effective in every state in which they have been put into effect. There has probably nothing been done, which will aid so much in improving the quality of the horses of the state where the laws have been enacted.

The states which have the most effective laws on this subject are Wisconsin, Minnesota, Pennsylvania and Vermont. The province of Manitoba, Canada, has also passed a similar law. Many other states will pass a similar law when their legislatures meet this winter. In fact, if some states have this law, it makes it much more imperative for the surrounding states to enact a like law as will be made evident later.

The requirements of the law differ somewhat, but in the main they have the following requirements. That the owner of a stallion which is offered for public service must send in to the registering officer the certificate of registration of the horse, if he is a pure bred. This certificate must be signed by a recognized, lawful breeders' association. If a grade, a license certificate is issued, indicating the horse is a grade. An affidavit must accompany the application for a license signed and sworn to before a notary public that the horse is sound or free from any hereditary disease. The owner of the stallion may furnish a veterinarian's affidavit as to the soundness of the horse if they so desire.

The license certificates are required to be recorded at the office of the register of deeds of the county in which the horse stands.

Most of the laws require a copy of the license certificate to be printed on the posters used for advertising purposes. The posters are also required to be posted in conspicuous places for purpose of informing the public of the nature of the breeding of the horse. There are the essential features of the laws, but they differ somewhat, however, in certain details of their provisions.

The benefits to be derived are:

1st. The public is informed whether a horse is a grade or a pure bred. Many farmers are lead to believe that grade stallions are pure breds from the nature

of the posters used to advertise them. This is a very fraudulent practice used to deceive the public.

2nd. Many bogus pedigrees are detected which proves the horse not eligible to registration and possibly only a grade. The buyer is often ignorant of having bogus pedigrees with his horse. If he is informed of the fact, he can prosecute the seller, and this in time will drive the fraudulent stallion dealers out of the state.

3rd. The necessity of letting any sound stallions to be offered for services is only fair and right. The stallion possessing an unsoundness will transmit the unsoundness to his offspring almost invariably. No farmer should be allowed to use a horse of this character and should be protected against the possibility.

Where this law has been enforced many inferior horses have been forced from public service. It is reported that these horses are sold to go to other states that have not a stallion service law. This means that it is imperative that the states adjoining the states with this law in force should get one in effect as soon as possible. There is a demand for one in North Dakota and an effort will be made to get the legislature to pass one this winter.

## VETERINARY MEDICINE AND SURGERY AT THE A. C.

In response to a petition of some twenty students, now enrolled at the college, the Board of Trustees at the North Dakota Agricultural College during their meeting of December 9th, established a full collegiate course in Veterinary Medicine and Surgery.

The action of the Board was taken after a careful consideration of the proposition, which was placed before them by the students. Upon inquiry it was found, that the student petitioners intend to enter the veterinary profession and would be compelled to seek the required instruction in other states after the completion of their preparatory studies. It was further learned that the college authorities had during the past few years received a great many inquiries after work in veterinary medicine and that even students who had come here expecting to find opportunities for that type of training had to be turned away.

In an interview, Dr. Van Es stated that the course would consist of four college years of strictly technical training. We would require as preliminary education a high school diploma or the evidence of completion of our present preparatory course or would accept the diploma of the Farm Husbandry Course in lieu of either. Of the four years' training, the first two would be devoted entirely to such fundamental branches as chemistry, physiology, descriptive and surgical anatomy, materia medica, and pharmacy, histology, bacteriology, general therapeutics, etc. The last two years will be occupied with the study of the principles and practice of veterinary medicine and surgery, hygiene, general pathology, obstetrics, horse shoeing, meat and milk inspection, veterinary jurisprudence, etc.

The intention is to make this course entirely a technical one, with a view of giving our students such an amount of training, that we are willing to trust to our high schools and preparatory courses for a sufficient amount of general training.

Who would you particularly advise to take such a course, doctor? To nobody in particular, but boys who are compelled to enter into some profession should give the veterinary field consideration, as the veterinary profession is gradually working its way to a dignified position among the learned professions, and while the most room is at the top, the over-crowding is not as serious as in the professions of law and medicine. The young veterinarian will be able to earn his living thru his profession sooner than the young members of the other professions. A boy who has land and who has no decided dislike to farming, should by all means take an agricultural course, but the young man who by not being blessed in that way is compelled to learn some profession may do far worse.

What opportunities does the profession offer? The doctor stated that a man's ability largely determined his opportunities. The general opportunities, however, are fairly summed up by a bulletin issued by the State University of Ohio. This bulletin states as follows:

### Demand for Veterinarians

"There is a growing demand for men who are skilled veterinarians. The close relationship between veterinary medicine and general medicine so-called 'human' medicine, especially along sanitary lines, has opened to the veterinary profession a large new field. At present a well qualified veterinarian has his choice of the following fields of labor:

1. As an inspector and assistant in the Bureau of Animal Industry. This is a very desirable position, protected by the civil service, and the appointments are made for life. The lowest salary paid to an assistant is \$1400 per annum.



The inspectors receive higher salaries, depending upon the importance of their respective stations.

2. An instructor at an agricultural or state veterinary college. These positions require the best trained men available and pay good salaries.

3. As an investigator of infectious and contagious diseases at state agricultural experiment stations. These positions are especially fitted to one who has the scientific ability and taste for original research. There is a great lack of men trained for such scientific work in this country, our veterinary schools, formerly teaching little or nothing of the sciences (botany, physics, bacteriology, pathological anatomy, etc., which form the foundation of a veterinarian's mental equipment.

4. As a veterinary surgeon in the cav-

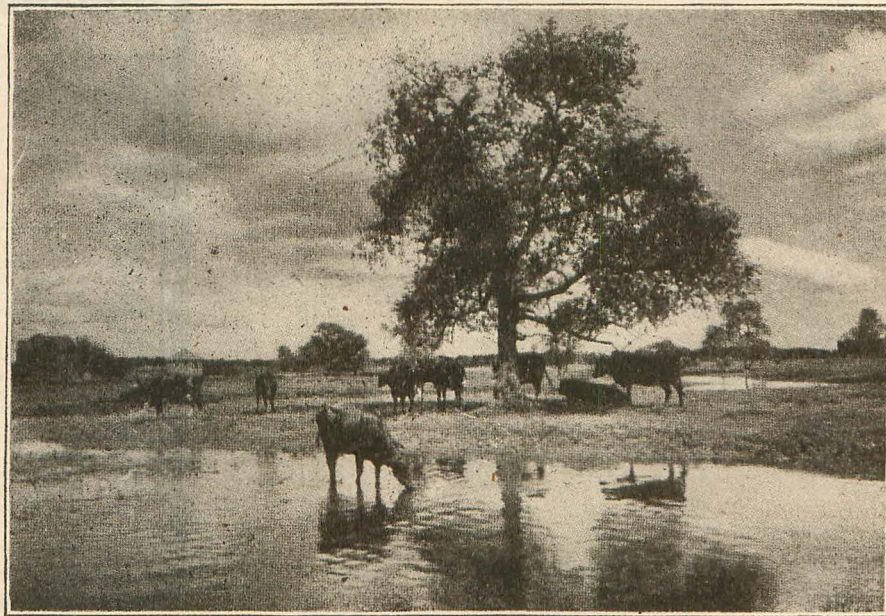
ities require the services of a veterinarian to care for and administer to the fire and police horses of the municipality. As time progresses one may look for greater demand for trained men from this source. Some of these positions pay as high as \$2500 annually.

7. As a stock farm manager. A number of veterinarians are employed on stock farms in breeding districts as managers. A thoroly capable man should be able to find remunerative positions open to him in such a line of work.

8. Practice. For those wishing to enter upon a regular veterinary practice, desirable locations are still plentiful in many parts of the United States, in towns, cities, and counties, where there are no regular veterinarians.

There are three times as many animals as there are human beings in the United

feeding experiments it has shown up favorably in comparison with cotton seed meal and linseed meal, tho not so rich in digestible protein as these substances. Gluten meal, which does not contain the hull and germ, is very valuable as a source of fat and protein, and can be fed similarly to gluten feed, tho owing to its richness, only moderate quantities should be used in rations for dairy cows. Corn oil meal or cake consists of the pressed germ of the corn grain, and is very rich in fat and protein. Only moderate amounts should be fed per day. Corn bran and corn germ, which consist chiefly of hulls and germ, are rich in fat and carbohydrates, and make very good substitutes for corn meal. Hominy meal, consisting of the softer parts of the grain, contains less water than corn meal, one to two per



Shade, either Natural or Artificial, is Essential to the Comfort of Man and Beast.

alry service of the United States. A bill now pending before Congress to elevate the standard of the army veterinary surgeon, granting him the rank, privileges and tenure of office of a commissioned officer, will make this service much more desirable than it is at present. However, the position now pays \$1500 yearly with perquisites.

5. As a state veterinarian. Many of the states now have state veterinarians, and the time is not far distant when every state in the Union will have such an official to attend to the preventable diseases of the animals of his particular state.

6. As a veterinarian to municipal health boards. Already several of our larger employ veterinarians as inspectors of abatoirs, butcher shops, of milk and dairy products, and to assist in sanitary work generally. Besides, some

States. There are ten times as many doctors of medicine as there are veterinarians. It must seem, then, that as the country grows older, and as the value of our live stock increases, the future must have in store for the skilled veterinarian an opportunity to succeed in his chosen vocation far more favorable than his professional brother, the practitioner of general medicine."

#### CATTLE FEEDS, HOW TO FEED

By Prof. A. M. Soule

Gluten feed consists largely of the whole grain less a part of the starch, and because of its fine physiological condition and richness in fat and protein, it is well adapted for use with other less concentrated grains in the preparations of rations for beef and dairy cattle. In

cent more protein, and twice as much fat, due to the presence of a considerable proportion of the corn germ. Hominy meal is rated as having ten per cent greater feeding value than corn meal. The extensive series of by-products resulting from the manufacture of corn into palatable forms of food for man can be fed advantageously on the average farm, especially as a number of them are rich in protein, and hence, combine admirably with corn.

In conclusion, both corn fodder and corn stover can be utilized extensively and profitably for the winter maintenance of live stock kept on the average farm. Their feeding value is not as generally appreciated as it should be, for a review of the situation reveals the fact that shredded stover and corn fodder can be made under favorable conditions to replace timothy hay. Corn of itself



is an unequaled food for fattening purposes, but not being well balanced, it will give better results when fed to beef and dairy cattle, in combination with cotton seed meal, or some leguminous hay, like alfalfa or red clover. For hogs, corn in combination with skim milk, or some protein food-stuff, like

wheat or soy bean meal, gives much better results than when fed by itself.

These views are somewhat at variance with those held by many farmers, but they are based on experimental data, and on that account should carry conviction to the mind of the average man.

### ST. PAUL UNION STOCKYARDS COMPANY

Report for December, 1908

#### RECEIPTS

|                     | Cattle | Calves | Hogs   | Sheep | Horses | Tot. | Cars |
|---------------------|--------|--------|--------|-------|--------|------|------|
| C. R. I. & P....    | 232    | 30     | 2692   | 316   | 2      | 44   |      |
| C. G. W.....        | 760    | 65     | 9633   | 703   | 39     | 145  |      |
| C. M. & St. P....   | 4008   | 325    | 24319  | 6344  | 91     | 501  |      |
| M. & St. L.....     | 979    | 229    | 14977  | 1936  | ....   | 238  |      |
| C. St. P. M. & O    | 1980   | 140    | 31573  | 4154  | 96     | 468  |      |
| C. B. & Q.....      | 243    | 16     | 2884   | 590   | ....   | 47   |      |
| Wis. Cent.....      | ....   | ....   | 1247   | 286   | 4      | 16   |      |
| P. St. P. & S. S. M | 2826   | 536    | 8699   | 2428  | 2      | 213  |      |
| Gt. Nor.....        | 4540   | 926    | 24044  | 8700  | 35     | 488  |      |
| Nor. Pac.....       | 4300   | 249    | 6508   | 6718  | 1      | 266  |      |
| S. Y. T. Ry. Co     | ....   | ....   | ....   | 189   | ....   | 1    |      |
| Driven in.....      | 761    | 58     | 644    | 883   | ....   | .... |      |
| Total.....          | 20629  | 2574   | 127220 | 33249 | 270    | 2427 |      |
| Total Last yr       | 16587  | 1790   | 115195 | 25571 | 121    | 2070 |      |

#### SHIPMENTS

|                     | Cattle | Calves | Hogs  | Sheep | Horses | Tot. | Cars |
|---------------------|--------|--------|-------|-------|--------|------|------|
| C. R. I. & P....    | 1093   | 59     | ....  | 2117  | ....   | 49   |      |
| C. G. W.....        | 1423   | 40     | 6275  | 1584  | ....   | 113  |      |
| C. M. & St. P....   | 2419   | 112    | 5475  | 1878  | ....   | 146  |      |
| M. & St. L.....     | 424    | ....   | ....  | 230   | ....   | 15   |      |
| C. St. P. M. & O    | 1790   | 26     | 5695  | 1282  | 38     | 123  |      |
| C. B. & Q.....      | 2927   | 32     | 9644  | 5543  | ....   | 215  |      |
| Wis. Cent.....      | ....   | ....   | ....  | 245   | 18     | 3    |      |
| M. St. P. & S. S. M | 284    | 60     | ....  | 1358  | ....   | 19   |      |
| Gt. Nor.....        | 304    | 46     | 78    | 2799  | 90     | 31   |      |
| Nor. Pac.....       | 253    | 118    | 745   | 3458  | 48     | 36   |      |
| S. Y. Ter.....      | ....   | ....   | ....  | ....  | ....   | .... |      |
| Driven out.....     | 1237   | 327    | 97    | 1259  | 36     | .... |      |
| Total.....          | 12154  | 820    | 28009 | 21753 | 230    | 770  |      |
| Total Last yr       | 10266  | 545    | 34213 | 12630 | 166    | 710  |      |

#### SUMMARY 12 MONTHS

| RECEIPTS    |           |           | SHIPMENTS   |           |           |
|-------------|-----------|-----------|-------------|-----------|-----------|
|             | This Year | Last Year |             | This Year | Last Year |
| Cattle..... | 400808    | 458763    | Cattle..... | 288894    | 363392    |
| Calves..... | 62352     | 60848     | Cars.....   | 13466     | 15509     |
| Hogs.....   | 1133412   | 866777    | Horses..... | 253071    | 72605     |
| Sheep.....  | 359343    | 567830    | Sheep.....  | 241049    | 488744    |
| Horses..... | 7125      | 14557     | Hogs.....   | 6691      | 14098     |
| Cars.....   | 30517     | 32776     | Calves..... | 13267     | 16984     |

### ANNUAL MEETING OF NORTH DAKOTA DAIRYMEN'S ASSOCIATION, BISMARCK

February 5th, 1909

#### Program

Address of Welcome

F. L. Conclin, Bismarck, N. D.

Response

A. Gabrielson, Fargo, N. D.

Dairy Legislation

R. F. Flint, Ass't. Dairy Commissioner.

The Dairy Department of the Agricultural College

Dean J. H. Shepperd.

Address

Hon. J. H. Worst, Pres. Agricultural College, N. D.

The Studying of a Dairy Herd

J. A. Bacon, Grand Forks, N. D.

Is Dairying Practical in North Dakota

Prof. Thomas Shaw, St. Paul, Minn.

Address

Gov. John Burke, Bismarck, N. D.

Tuberculosis and its Control

Dr. L. Van Es, Agricultural College, N. D.

Successful Dairying

Mrs. Adda F. Howie, Elm Groove, Wis.  
T. A. Hoverstad, Sec.

### THE COVERED MILK-PAIL

Hugh J. Hughes, N. D. A. C.

One of the greatest drawbacks to the production of a high-class home-made dairy butter is the ordinary milk pail. It is practically impossible to obtain dirt free milk when the open top pail is in use, even tho washing the cow's udder be resorted to, and every other precaution making for cleanliness be taken. If a pail of milk, drawn under ordinary conditions, be strained thru a folded cheese cloth, and the residue examined it will show, in every instance, the needs of more care with the milk pail.

### THE BEST LINIMENT

OR PAIN KILLER FOR THE HUMAN BODY

**Gombault's**  
**Caustic Balsam**  
IT HAS NO EQUAL

**For the Human Body**

—It is penetrating, soothing and healing, and for all Old Sores, Bruises, or Wounds, Felons, Exterior Cancers, Boils, Corns and Bunions. CAUSTIC BALSAM has no equal as a Liniment.

We would say to all who buy it that it does not contain a particle of poisonous substance and therefore no harm can result from its external use. Persistent, thorough use will cure many old or chronic ailments and it can be used on any case that requires an outward application with perfect safety.

**A Perfectly Safe and Reliable Remedy for**

**Sore Throat**  
**Chest Cold**  
**Backache**  
**Neuralgia**  
**Sprains**  
**Strains**  
**Lumbago**  
**Diphtheria**  
**Sore Lungs**  
**Rheumatism**  
**and**  
**all Stiff Joints**

**REMOVES THE SORENESS—STRENGTHENS MUSCLES**

Cornhill, Tex.—"One bottle **Caustic Balsam** did my rheumatism more good than \$120.00 paid in doctor's bills."  
Price \$1.50 per bottle. Sold by druggists, or sent by express prepaid. Write for Booklet R.  
The LAWRENCE-WILLIAMS COMPANY, Cleveland, O.

### CLASSIFIED ADS.

#### HORSES

##### FFOR SALE

Registered Percheron horses and shorthorn cattle.  
STERN BROTHERS, Fargo, N. D.

##### FOR SALE

Percheron, Belgian and Shire horses  
J. W. & F. T. PETERSON, Litchfield, Minn.

#### CATTLE

North Branch Stock Farm. High class Short-horns. Herd, bull, Supreme Judge 177722—pure Scotch. John Donnelly, Grafton, N. D.

##### REGISTERED RED POLLED CATTLE

Young Stock of Both Sexes For Sale.  
C. G. FAIT & SON, Monango, N. D.

##### FOR SALE

GALLOWAY CATTLE  
J. W. & F. T. PETERSON, Litchfield, Minn

#### SWINE

POLAND CHINA PIGS, also Shropshire sheep. Seed grain. GEO. N. SMITH, Amenia, N. D.

#### MISCELLANEOUS

Special Prices at Envilla Stock Farm of almost every kind. Write for a list to Cogswell, N. D.



We would recommend the use of a covered pail, having a small opening at the center, where the milk can drain thru several thicknesses of cheese cloth. In this way much of the floating dust, loaded with bacteria, that settles in the milk pail, will be avoided. The cow's flank and udder should be washed to remove all filth and scales, loose hairs, and particles of straw and dust that may be clinging to the body. It is needless to say that the person and hands of the milker should be clean, and he should not dip his fingers into the milk stream in order to moisten the cow's teats. At the time of milking all offensive odors should be absent, as far as possible. A dark, foul smelling, dust laden barn can hardly be a source of really "sweet" milk.

It is this filthy condition when taking the milk that is largely responsible for poor butter, because, as we say, the milk becomes "tainted" with the odors of the barn. In point of fact the more serious result of a lack of cleanliness is that the milk is invaded by swarms of bacteria that find in it an excellent place of growth, and the work of the ordinary souring bacteria is interfered with. As a result the cream differs from time to time in its character, the noticeable "taint" of the milk is present, and the bad effects of neglect at the time of milking is carried over to the butter, which is uneven in quality, and lacks very much of that sweetness that goes with the highest care and cleanliness about the dairy.

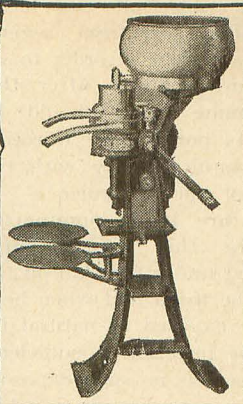
Milk pails such as we speak of may be bought for about double the price of the ordinary pail, but, taking into account the nearer approach to cleanliness, and the better quality of butter produced, they would be cheaper at almost any price.

#### THE COW, THE FEED, THE MAN

By R. H. Herbison, Instructor in Dairying, N. D. A. C.

In addressing a dairy meeting a short time ago, Professor Haecker of Minnesota stated that it was a known fact that a large percentage of the western cows which under the ordinary treatment produced but 150 pounds of butter per year, with the right kind of feed and proper care would produce as much as 200 or even 250 pounds per year. This shows that the feed and care a cow gets is almost half.

Therefore it can readily be seen that the average cow is better than the average keeper. Altho the creamery is something which is really necessary for the development of the dairy interests, the cow, the feed, and the man make the foundation, and to get these is now the question that demands the most careful consideration.



## TIME TO BUY CREAM SEPARATORS NOW

There never was a better time to buy the best of Cream Separators than right now.

The advantages derived from the use of the good Cream Separator are greater in the fall and winter than at any other time,—when the cows are old in lactation, the loss of butter-fat is otherwise greatest, and prices highest.

Likewise are the advantages of the superior DE LAVAL separators greatest over imitating separators when the milk is hard to separate and the weather cold and variable.

In every case a DELAVAL separator, of suitable size, will surely at least save its cost between now and July 1st next, and go on returning 100% per year on the investment for twenty years to come.

The agricultural and particularly the dairying outlook was never brighter and more promising.

#### WHY NOT BUY NOW?

Send for Catalogue of 1908 Latest Improved Machines.

### THE DE LAVAL SEPARATOR CO.

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PHILADELPHIA  
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We have sold all of our

Oxford Down Ram Lambs,

But have a few choice ANGUS  
BULLS AND WHITE PLYMOUTH  
ROCK COCKERELS left to sell.

#### WILLOBANK FARM

Eastgate Bros., Larimore, N. D.

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Try our Classified Ads. The cost is reasonable.

NORTH DAKOTA FARMER

### THE ENVILLA STOCK FARM

COGSWELL, NORTH DAKOTA

100 HEAD REGISTERED ANGUS CATTLE.  
100 SHETLAND PONIES AND GRADES.  
50 REGISTERED HOGS—Dorset Jersey Hogs.  
5000 HEAD POULTRY—All varieties; Rocks, Wyandottes, Leghorns, Reds, Brahmas, Orpingtons, Houdans, Minorcas, Games, Javas, Hamburgs and Bantams.  
GEESSE—Toulouse, Embden, Buff, Chinese, African and Canadian-wild.  
TURKEYS—Mammoth Bronze, White Holland and Buff.  
DUCKS—Pekin, Muscovy, Wild Mallard, Indian Runner.  
PEA FOWLS, PHEASANTS, PEARL AND WHITE GUINEAS, FANTAIL PIGEONS.  
RABBITS, HARES, GUINEA PIGS, SQUIRRELS, ANGORA CATS, WOLF, FOX AND  
RABBIT HOUNDS, COLLIE AND PET DOGS. FERRETS TRAINED FOR RATS.  
Write us for complete price list of varieties. Remember we won 90 per cent of the Blue Ribbons at State Fairs 95-6-7. Order your eggs for hatching, poultry and stock of

L. H. WHITE, Proprietor,

ENVILLA STOCK FARM,  
Cogswell, N. D.



### DR. VAN ES PROVES THAT CHOLERA SERUM IS SUCCESS

Dr. Louis Van Es of the Agricultural College has submitted his report on the investigation of the prevention of hog cholera to Dr. W. F. Crewe, executive officer of the livestock sanitary board of North Dakota.

All but a small portion of the report is taken up with these experiments in preventing the disease which is so dreaded by farmers and is an evidence of the vast improvement of the discovery of preventing cholera by vaccination.

In part Dr. Van Es's report is as follows:

Under the authorization of the board of trustees of the Agricultural College the writer, during the month of July, 1908, visited the bureau of animal industry experiment farm at Ames, Ia., in order to become acquainted with a new method, devised by Drs. Dorset, McBryde and Niles, of the bureau mentioned, of preventing hog cholera.

The writer returned from Iowa quite convinced of the practical value of the method and after rendering the report of his findings, was authorized and instructed by the station authorities to proceed in the manufacture of a limited amount of serum.

Essentially the method consists in rendering the animals passively immune by the injection of an antitoxic serum and while the animal is thus protected, to make its immunity active by exposing it to natural infection by injecting it with a small quantity of virulent blood.

The first step in the manufacture of serum consists of the immunization of the hogs, which later are to furnish the protective serum. This is done by the simultaneous injection of a quantity of protective serum previously obtained and some virulent blood.

Hogs which do not receive the protecting serum, promptly sicken with cholera in from seven to fourteen days and when the disease has reached its fullest development, they are bled to death and the blood carefully collected. This blood is used for hyper-immunizing purposes, as well as for the propagation of the virus.

Hyper-immunizing consists of the introduction of an enormous amount of virulent blood into the system of the immunes.

Hogs treated in this way become hyper-immune in from five to ten days and their blood will confer a passive immunity when injected into a susceptible animal. The hyper-immune blood is drawn by cutting a piece off the animal's tail under sterile conditions and the blood collected.

The blood drawings are kept until the

final bleeding, when all the blood from one animal or from several is mixed. This is done in order to secure a uniform product. After this the hyper-immune blood should be tested as to its potency by injecting it into pigs, simultaneously with the cholera blood of known virulence.

When hogs are to be immunized against cholera this hyper-immune blood is injected under the skin on the inner side of the thigh and when hogs so injected are exposed to natural infection this one injection is sufficient. If, however, there is no such exposure or when the exposure is questionable, it is necessary to inject virulent blood at the same time in order to obtain active immunity. In our experiments this has proven to be of great importance, especially when we are working in herds in which the disease has just made its appearance.

Owing to the introduction and subsequent dissemination of the disease thruout the state, there has been ample opportunity for watching the result of the method under natural conditions. In fact, so great was the demand, that in the beginning of our work the serum was issued the moment it was drawn from the hyper-immunes.

At this date it is not possible to make a careful analysis of the results obtained with the serum in the field, because the returns are quite incomplete. Let it be enough to say for the present that in many instances the returns have been very favorable, while in others failures can be recorded. There is reason to believe, however, that the latter are principally due to the lateness of the serum injections in regard to the beginning of the introduction of the infection in the herd, in fact, some of the returns show that only sick hogs

were injected, in spite of the explicit instructions to the contrary.

From our experiments it would seem advisable to practice the simultaneous virus-serum injections in all herds in which infection had not yet been introduced and also in those where immunization is undertaken at the beginning of the outbreak and in which only a limited number of cases have occurred. Also in herds which are divided in several separate lots the simultaneous method should be used.

While the cost of producing the serum by the method taught by the bureau of animal industry is sufficiently low to warrant its general use, a reduction of this cost would certainly increase the range of usefulness of the serum as a means of eradicating hog cholera, especially in those states, where this kind of work has to be carried on with inadequate funds.

I consider it unnecessary that all hogs be immunized promiscuously in the country.

Breeders who take their stock to swine shows, fairs and sales, should always have their swine immunized.

When outbreaks occur the livestock board should be immediately notified.

A cordon of immune animals should be established around the center where cholera breaks out.

All hogs showing evidences of cholera should be destroyed and burned immediately to prevent the carrying of the disease.

I am confident that if such measures be taken, the danger from cholera can be reduced to insignificant proportions.

While the cost of producing serum by the present method is sufficiently low to warrant its general use, a reduction of this cost would certainly increase the range of its usefulness.

## Poultry Department

### POULTRY EXHIBIT AT THE TRI-STATE OF 1909

#### POULTRY EXHIBIT

The poultry exhibit at the Tri-State of 1909 is regarded by experts to be one of the finest ever held in Fargo.

Fanciers over the state are growing to prize the scorings and records received in the state association, and what is better, the number of farmers who are learning the importance of more blue blood in their flocks is growing larger.

J. D. Vowles's list records showed 352 birds in the different classes and that with the birds for exhibit only there were over 525 birds in the exhibition, and there are more en route to Fargo.

This year the judging will be done by E. G. Roberts of Wisconsin, one of the largest poultry breeders in the west and a judge of very extended reputation. With Mr. Roberts the best bird wins in every instance.

Judge Roberts is now judging, beginning with the American class, taking the Plymouth Rocks first, a big task as there are so many entries in this class.



## TEN DOLLARS AS A POULTRY INVESTMENT

O. W. Dynes, Assistant in Poultry Husbandry

If I were in the position of the average North Dakota farmer and wished to invest ten dollars in poultry where it would do the most good, my plan of procedure would be as follows:

1st. I would carefully examine the well known breeds of poultry at the poultry shows, or elsewhere, and diligently inquire into the merits of the various breeds. It is probable that the type of fowl as represented in any one of the varieties of the Plymouth Rock, Wyandotte, Rhode Island Red and Orpington breeds, will be found best for farm conditions in this state. I would pick the variety that suited my own tastes and forthwith invest nine of my ten dollars in breeding stock. Four females, pullets or yearling hens, of good breed type can be easily purchased from a reliable breeder for \$6. This will leave \$3 for a good male bird of the same variety. Either one of two things must be done when spring arrives. The scrub stock must be gotten rid of or the new birds isolated during the breeding season in an enclosure built for that purpose. With reasonably good fortune in hatching and brooding a sufficient number of pullets should be raised the first year to form a respectable sized flock. At the beginning of the second year none of the original scrub stock should be found in the poultry yard.

The remaining dollar would buy a year's subscription to two good poultry papers. The Poultry Herald of St. Paul, the Reliable Poultry Journal of Quincy, Ill., and Farm Poultry, Boston, are publications which can be safely recommended as good poultry literature.

## CHICKEN FEEDING EXPERIMENTS

In some experiments recently made by the Rhode Island Experiment Station in feeding chicks with various protein rations, the cost of feeding materials per 100 lbs. is given as follows: Bran, \$1.30; middlings, \$1.30; oat meal, \$3.50; corn meal, \$1.30; cut clover, \$2; granulated milk, \$3.50; cotton seed meal, \$1.70; gluten feed, \$1.55; animal meal, \$2.75. These prices are just about what we have to pay for feeds here. The Station states that the animal meal gave decidedly the best financial returns, as the chicks reached a marketable weight fully two weeks ahead of the next lot, which received granu-

lated milk and ash. Had these two concentrates cost the same, the labor, fuel, and interest saved on a house full of chicks fed partially on the animal meal would have far outweighed the slightly greater cost of feed per pound of gain.

The cotton seed meal was used especially to ascertain its effects upon chicks as compared with its known effect upon other young animals. The ration contained an excessive amount of it, from the standpoint of bulk, and the chicks died very rapidly, at first, from bowel trouble. The ration was unpalatable, and both lots showed symptoms of starvation at the end of the first period. The Station's summary of results is as follows. The indications are:

"1. That the phosphorus and lime in the ration are fully as necessary as the protein. The addition of a small amount of bone-ash and carbonate of lime multiplied the efficiency of the protein by two and one-half in the gluten feed ration, and a very decided gain was noted from its use in every case excepting that of the cotton seed meal ration in one period.

"2. That cotton seed meal cannot be recommended at any price as a concentrate to form a considerable portion of a ration for chicks. The chicks which died did not exhibit the symptoms of poisoning which have been unquestionably noted in connection with other animals which are poisoned by feeding them cotton seed meal.

"3. That even if the addition of commercial material such as ground bone or floats and limestone to the ration could render protein in the form of milk albumen or gluten feed equal in efficiency to protein in the form of animal meal, it might not be possible to induce the chicks to eat sufficient feed to cause them to grow as rapidly as those receiving animal meal. It must be recognized, however, that animal meal, like beef scrap, is widely variable in character and quality; and that with material inferior in taste, odor, or composition, equally good results might not be secured. At all events, poultrymen, in the growing of broilers, are not warranted in paying more per pound for protein in these feeds than in animal meal similar to that used in this experiment.

"In a turkey fattening experiment the results secured seem to indicate that:

"1. For a short feeding period, there is not sufficient advantage in using a wet mash of mixed grains, at the prices quoted, to warrant the turkey fattener in adopting the ration.

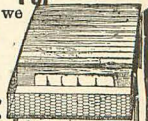
"2. While the feeding of a mash partly in the trough and partly with the cramming machine gave the greatest average gains at the least cost for feed, the added outlay for labor over feeding corn on the range would make the latter method more profitable.

"3. Heavy feeding may hasten the development of the "blackhead" disease, if it is already present in the system."

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If ordered together we send both for \$10 and pay freight. Well made, hot water, copper tanks, double wans, double glass doors. Free catalog describes them.

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**M. B. Turkeys** sired by my First Prize Win- ings and Diploma Tom, for sale. Also White Holland Turkeys, Toulouse Geese, Pekin and Rouen Ducks, and 23 varieties of Chickens. Write for Catalogue.

**L. GULDEN, - - - Osakis, Minn**

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**H. H. HINIKER, Dept. 16 Mankato, Minn.**





# Home Affairs

Katherine C. Neilson, Editor, Mayville, N. D.

## PIONEERING IN THE '70'S

This New Year announcing calamity with attending sufferings here and abroad, recalls the severity of some Januaries in the '70's, when pioneers in Dakota Territory opened new homes, which were commenced and hardly completed before the severity of the coldest month overtook their work.

This instance relates to a family who moved in early days from Illinois and took a homestead.

On an adjoining quarter was an unoccupied log-house, which the family lived in until their small frame house was ready, a half mile distant.

December days were growing short but the cold was strong, the old log-cabin was losing it chinking of clay, and many mornings three little children ate their breakfast from the top of the stove with their feet in the oven.

The frame house in construction was consuming too much time for men to make a mile in a round trip for dinner, so the mother thought of, and suggested, a move.

The carpenters consisted of the father and two inexperienced workman, tho any man who could saw a board or drive a nail was in demand at that period in a new country.

The men remonstrated. They did not care for tenants during lathing and plastering. Persistently the tubs, boxes and baskets were packed, with dishes and food and children, the four months old baby was snugly sleeping in the clothes-basket and all the necessities placed on a two-by-four-sled and headed for the homestead.

The old sorrel horse would not move when requested until he had turned and made a survey of his load, then he trotted along to the door of the new house where a very uncordial welcome awaited the arrival of the guests. The abundance of provisions baby and all were unloaded, the clothes-basket was taken to the cellar and poised on a pile of dry sand, for here was a fire to keep the mortar from freezing.

The broom soon sent the shavings and sand to the borders of the room; a table was spread and food for the evening meal soon changed the minds of the builders. They did not have the half mile walk after dark.

Fuel was obtained down by the river one-half mile, by felling trees and hauling them to the house to work up. This was green elm, which was not a pleasant

task to kindle and all wood had to be dried in the oven or piled behind the stove for several days. Wood-piles were rounded high in snow-drifts outside, for no pioneer could afford a woodshed, besides digging it out of a snow-drift seemed more natural.

The fagots often ran low before another tree could be drawn up before the door.

The mother was becoming rheumatic from the exposures and hardships in a cold region; her feet were painful; while cooking she knelt in a chair; some help was needed.

The husband informed his wife one day that he had heard where there was a good girl who would come to work. The situation was growing worse, so one morning after breakfast he proposed making the trip for a helper.

He said, "It looks like a storm and may last several days, shall I go after that girl or get a load of wood?"

The wife replied, "If it storms we can do without the help better than we can without fuel." At once he started, driving away with a bob-sled and team. This was about 9 o'clock A. M.

The wife expected he would return in the afternoon as usual, but afternoon came and no return. Evening and midnight grew more intensely cold and yet no sounds of relief.

The stock in the straw barn needed attention, the baby was ill. The children slept soundly, their troubles ended with the day.

A sleepless night was that. Frequently the troubled mother would gaze from the window, then go outside and try to distinguish the sound of the sled screeching on the snow path. The cold, still night only gave bright starlight and answered in the lament of Hiawatha in the *Famine*:

"O the long and dreary winter!  
O the cold and cruel winter!  
And the hungry stars in heaven  
Like the eyes of wolves glared at them."

"Could it be that our father had been killed by a falling tree? He was alone, and no one to report if accident had come to him! If he has been injured and is lying under a tree he will surely perish. Of course the team is hitched and the horses are suffering."

This picture of calamity was real to her. "Are we left fatherless and widowed with five helpless children and not a soul to call upon to suggest one comforting possibility, what am I to do?" All of these questions were asked in fear

and suspense. It was too vivid to be the reverse.

"I must be brave as others have been, and endure the tragedies of pioneer life." As daylight appeared resolutions became firmer. "Something must be done."

The scant amount of wood is estimated; the fire is replenished with the last pile of fagots from the snow-drifts, the elder children are left in charge and cautioned about the care of the stoves and danger of fire for mama is going two miles to a house for help. The **rheumatic** feet were encased in a pair of men's boots, a suit of her husbands was worn, better adapted to plodding thru the deep snow.

The determined woman crossed an unbroken quarter section deep with crusted snow and broke thru at every step. Having reached the house where two young men were baching and giving several hard knocks on the door, a response came.

Their morning nap was broken tho the hour was 10 o'clock. She called the two by name and made known her sad errand. Shortly they opened the door and kindly offered every assistance in their power. One returned with her to care for the stock, and the other was dispatched to a large farm across the river, stated the conditions and possibilities to the farmer who was a friend of this family, and asked, "When you come to the rescue, would you kindly throw some wood into your sled?"

As she retraced her steps toward home with the young man, he offered kind words of consolation, for which she thanked him but could not be comforted.

Having arrived at the home she saw merry faces at the window pane, "watching out for me." Trouble was certainly not their guest.

The chores were done and a meal prepared for the young man, when the farmer across the river drove in. He appreciated the stress of circumstances, tried to dispel fears and showed a genuine big heart full of sympathy, still the would-be brave-hearted mother appealed thus, "Is it not evident that some calamity has befallen him since he went alone to the wood to cut down trees and has been away twenty-four hours?"

While they were busily engaged throwing the wood from the sled, the scene suddenly changed.

"Hello neighbor! Did you think I was out of wood?" The voice came from a man in a cutter bundled out of sight and covered with frost and snow, while another bundle by his side proved to be a girl, half frozen, instead of the load of wood.

After departing for the wood lot, the plans were entirely changed, for storm signs vanished and a horse and cutter



were substituted for the double team and sled, in the nearby town. Driving out nine miles for the maid, and losing the direction caused the delay over night.

The sad experience was never to be forgotten and the saddest yet was to come. Just one month from that day of strenuous mental suffering the little one, the baby, died of diphtheria, brought into the family by this stranger, who had come from a family recently afflicted with this scourge.

That anxious night, the subsequent illness of the children and the death of the baby, as well as effects of rheumatism, are potent reminders of pioneer perils.

brand is reliable and gives a fine flavor to the meat if one follows directions.

To pack hams, and smoked meats. Save your coal ashes, sift them. Use a clean barrel, wrap the meat in paper and place alternately with coal ashes, cover the barrel tightly and place in a cool dry place out of the light. They will keep perfectly for six months or more.

Dried beef, dried veal and mutton are fine meats for summer use exclusively. Using the hams of each variety, sugar, salt and a small amount of soda is heated in the oven and rubbed in by hand. Place in a tray, jar or tub and turn every three days to absorb their juices. Rub in the mixture three times, once every three days. Turn the pieces, after a

trouble in recognizing as the "staff of life" the yellow cream colored article that makes its appearance on their tables under the name of bread. For so long has the bread of this country been of an absolute whiteness, the new order of things will probably do more than anything else to bring home the fact that we have in North Dakota, and the rest of the United States also, a pure food law, and a commissioner to enforce it.

Beginning January 1, it will be illegal to manufacture in the state of North Dakota, flour bleached from its natural color. For so long have we been accustomed to the virgin whiteness of our bread that we are, most of us, unaware that flour made from a northern hard wheat is not naturally of that color. But it is nevertheless true that if the flour is unbleached it is not white. It has a certain yellowish cast that resembles the color of rich cream. Not quite so pleasing to the eye, perhaps, but infinitely more healthful for the stomach.

Some years ago Professor Ladd conceived the idea that under the bleaching process, the millers of the country were mixing and selling as high grade flours the product from inferior grades of wheat. He also thought the process by means of which this inferior wheat was made to resemble the better grades was injurious to the health of the consumer, and the consumer in this case is everybody that eats bread. He made a series of investigations, gained several rather startling results, kept the matter to himself and continued to work on this line until he had unearthed the whole fraudulent process. That it was injurious to the consumers' health was amply proven by the manner in which it speedily destroyed the rabbits and guinea pigs to which the extracts from this flour were fed.

The commissioner's discoveries were announced to the world and after much haggling among the different scientists, came to be recognized as true, and the process which produced the conditions, as harmful. In the past month or so the subject has been given a large amount of publicity thru the ruling of Secretary Wilson, of the United States department of agriculture, that the manufacture and sale of the "bleached" flour, as it has been called, should stop in the United States at the end of six months.

Thinking that the millers of North Dakota, where the discussion had its birth, had been sufficiently warned and were perfectly aware of what was expected of them Commissioner Ladd decided not to wait for the expiration of the secretary's six months, and made a ruling for the state of North



Give the Boy and Girl an Interest in the Stock

#### WHY SHOULD FARMERS BUY THEIR MEAT?

When barley is at the present high prices and farmers can get but four or five cents a pound for pork alive, why should they raise pork for market? If they raise enough for their own consumption and learn how to cure it properly in the shape of salt pork, pickled hams, shoulders and bacon, lard, sausage, head-cheese and pickled pigs' feet, they are getting a good price for their pork by saving the money they would pay to the market, from 10 cents to 18 and 20 cents per pound. This can be figured easily. It is not too late now to prepare the meat. Have it all cured, smoked and packed away before the first warm days of spring bring the big flies.

Using "Smokine" is a safe and expeditious method. "The Log-Cabin"

week or ten days, wipe them dry and hang in the kitchen overhead to dry. Pin paper over it to keep off dust, when well dried outside, pack away as you do your cured hams, use "Smokine" if you like beef smoked.

There are many dainty dishes made with dried meats.

In New England on the farms a surprise-party-dinner was ever in the larder for unexpected guests, and none more delicious than the dried-beef and real cream gravy garnished with slices of hard boiled eggs, served with baked or boiled potatoes.

This N. E. cook vouches for the delicacy of dried veal and mutton as her preference.

#### BLEACHED FLOUR NO MORE

From now on American housewives and business men may have some



Dakota, that the practice should be discontinued after the first of the coming year.

#### Millers to Abide by Law

Now comes the word that the millers have talked the matter over, have considered it from every side of the question, and are, at last, willing to abide by the ruling, and the manufacture of the bleached flour, and the appearance on our tables of the "staff of life" in its snowy purity of color will simultaneously cease after the first of the year. That the millers of the state are acting in good faith to abolish the process was proved yesterday when one of the largest milling companies called the commissioner up on the long distance telephone and informed him that they had in their warehouse at present seven carloads of bleached flour and asked his advice as to its disposal. They were requested to dispose of it without the state and assented, adding that from now on the bleaching machinery in the firm's mill will be entirely out of commission and that no more bleached flour shall be made in the establishment.

"The millers," said Professor Ladd yesterday, "are not so much to blame in this matter as might be thought. As far as the millers themselves are concerned they are secure in the conviction that people must eat bread and that they will always find a ready market for their product, bleached or unbleached. The most of the opposition to the movement for the manufacture of pure unbleached flour comes from the Allsop people, who manufacture and sell the machinery whereby the bleaching is accomplished. In the marketing of the unbleached product these people see the failure of their business and they are making a strenuous fight against it.

"In several instances I have received word that the millers having Allsop machinery installed in their mills have been repeatedly told that they would be protected by the company in the manufacture of the bleached flour even against the law.

"But now," continued the short little man, who, with public opinion behind him, has accomplished this revolution, "I think the millers realize that their last excuse is gone and lately I have received many letters assuring me that such and such a company was doing away with the process and that from now on no bleached flour would be manufactured in their mills. Even the large mills farther east, where they have still six months grace in which to leave off the process are discontinuing it at once. Only yesterday I received a letter from the largest milling firm in the country ac-

companied by a sworn statement that none of the flour that left their mill was bleached.

"The millers in a way were driven into the use of the process by the wiles of the middlemen or blenders, who first introduced the machinery, and by its aid bought and mixed one sack of good flour with several sacks of poor flour, bleaching the whole to the same appearance and marketing it at the price of the high grade flour. These were the people who first created the demand for the bleached flour and to comply with this demand the millers were forced to adopt the process in order to compete. Now that public opinion has changed so that

the demand is no longer for a pure white flour, the deception can no longer be practiced and a number of these middlemen will find themselves out of employment."—Fargo Forum

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## FROM THE NATION'S CAPITOL

By GUY E. MITCHELL

### DOCTOR WILEY STILL ON TOP

Ever since the Pure Food Law was enacted by Congress, and even before, when Congress was having hearings on the proposed legislation, Doctor Harvey W. Wiley, Chief Chemist of the Department of Agriculture, has been a target for the opponents of a law which required foods and drugs to be branded for what they are. This opposition has obstructed progress under the act from the day it was approved by President Roosevelt. It has had the advantage of every device of resourceful lawyers. It has dogged every other bureau of the Government whose work was even remotely related to the administration of this new law. It has laid siege on Congress. At one time it was ingenious enough to array three bureaus of the Government on three different sides of the case—the Bureau of Patents, the Bureau of Internal Revenue and the Bureau of Chemistry. Now it has succeeded in having an extra committee appointed whose function it is to recast and review the information upon which the Agricultural Department and the Bureau of Chemistry have already acted with regard to labeling the different grades of whiskey for what they actually are.

Far and wide went the report a week ago that Doctor Wiley is so much opposed to this committee that President Roosevelt has asked for his resignation. It is stated on authority, however, and none other than that from the highest possible source that there is no foundation in the yarn.

The first decision which brought out opposition was that which stated that whiskey must be whiskey. Then Secretary Wilson issued a decision that flour to be flour must be pure and unbleached and that if any process is employed to

give flour a white appearance, that fact must be stated on the label. The pure food law was enacted for a purpose and it is up to the officials of the government to see that it is enforced.

It is a good plan to have an evergreen windbreak on the north and partially down the west side of the garden. An objection raised is that nothing will grow near the trees. This is more due to the roots spreading out into the garden ground than to the tree shade. To overcome this open up a deep furrow each spring eight or ten feet away from the trees and force them to sustain themselves from the other side. This will not injure the trees and will allow comparatively close planting.

There is a great awakening in the poultry industry among the scientists of the country. Twenty or more states have established experiments stations and in addition, three years ago the Department of Agriculture started a station at Baltimore, Maryland. At the State experiment stations there are regular courses of instruction in poultry raising, while scientific experiments are made to determine the comparative values of different breeds and varieties, the best methods of housing and breeding and the value of the different foods. The poultry industry has long been deserted by the scientists and in spite of them, according to figures prepared by Secretary Wilson, the value of the eggs and poultry produced on the farm last year was \$620,000,000—as much as the cotton crop, seed included, or the hay or the wheat crop.

### FOOT AND MOUTH DISEASE IN CHECK

Ever since November 10, when the foot-and-mouth disease in cattle first



made its appearance in the vicinity of Danville and Watsonstown, Pennsylvania, the epidemic then spreading to Maryland, New York and Michigan, the Federal government, thru the Bureau of Animal Industry, has carried on a vigorous warfare against the malady until it is practically exterminated in all of these states and the quarantine established by the Department of Agriculture in Maryland; New York and Michigan has been modified. The lifting of the quarantine now permits the shipment out of New York of hay and hides; in Maryland, excepting two counties of hay and hides and cattle for immediate slaughter, and the same is true in Michigan, excepting in five counties. The department is considering the advisability of modifying the quarantine in Pennsylvania.

"I believe we have about gotten the foot-and-mouth disease corralled," Secretary Wilson declared. "No new outbreaks of the disease have been found since that which occurred in Snyder county since that which occurred in Snyder County, Pennsylvania, December 18. I want to emphasize, however, that we are letting up in our investigations very slowly, because if we didn't, foreign countries might quarantine the whole United States, as they are very fearful of getting the infection."

The Department of Agriculture has had a force of 150 veterinarians and as many more non-professional men engaged in the work of eradicating the disease, the cost of which it is estimated will be fully half a million dollars in the four states. The total number of animals slaughtered was 3,605, valued at \$88,2681, of which the federal government will pay two-thirds and the states affected one-third.

#### BATTLE BETWEEN LOCUST AND WASP

The big Digger Wasp, the largest and most ferocious of the wasps in the eastern part of the United States, has an easy way of providing for his family. It allows one bug—a locust—to each child and the young worm-wasp must rear itself upon this, spin its cocoon and then emerge into the world a full-fledged wasp all by its own efforts. Once her egg is laid, the old wasp knows that all is thenceforth well and has no further worry.

Doctor L. O. Howard, the Government entomologist, describes interestingly the constant warfare which goes on between the Digger Wasps and the several kinds of cicadas, which are popularly but incorrectly termed "locusts."

"When the note of the Cicada is filling the air with its vibrations" Doctor Howard says, "the big wasp is often seen flying about the tree from which the song comes. Suddenly the regular note of the

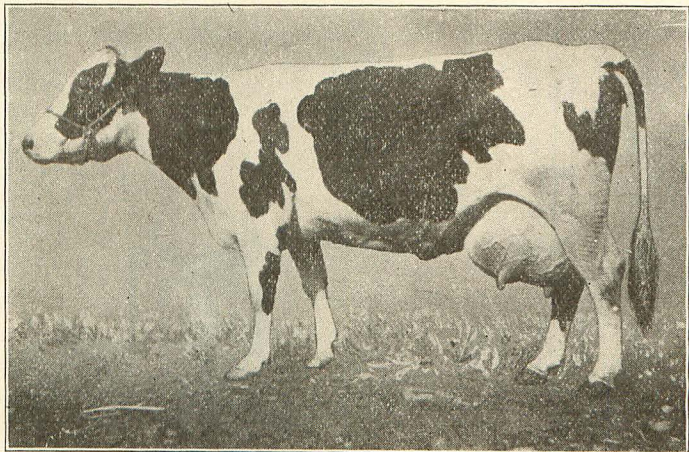
cicada ceases and in its stead a distressing discordant cry will ensue. The wasp has caught its victim and with its quick sting has thrown it into a comatose condition from which it never recovers. In the struggle both the wasp and the cicada may fall to the ground; then the wasp begins the laborious struggle of dragging its prey back up the tree, for the cicada is much larger than the wasp. It may be an hour before the wasp reaches a high enough point on the tree from which it can fly with the cicada obliquely down to its clay burrow some distance away. The wasp then deposits an egg under one of the legs of the cicada and as soon as this hatches, the grub begins devouring the big locust,

which it finally entirely consumes.

The seed catalogues will soon be on the tapis. Then there will be the usual proportion of people who will start out with enthusiasm and determination to have a fine garden. They will plow and harrow and spade and rake and plant. Then will come the rut. First it will be too wet to cultivate, then too dry and the final result will be about half a crop. Yet there is nothing more satisfactory or indeed profitable than a good garden. But it takes considerable timely hard work and some little planning and because it does not produce a money crop, too many folks never do it justice.

## ELEMENTARY AGRICULTURE

By G. W. Randlett, N. D. Agri. Col.



Colantha 4's Johanna

#### Sixth Month: The Profitable Dairy Cow.

The last lesson gave an idea of the correct form of the dairy cow. The purpose of this lesson will be to point out the method of determining which cows are profitable and which are not.

There is perhaps no class of farm animals in which the different members vary so much in individual merit. Indeed the variation is so great that many lack the property of merit entirely and are kept at an actual loss, while others may yield the owner a much larger profit than he knows. The last U. S. census report gives the average yield of all the dairy cows of this country as \$27.50 each, an amount scarcely sufficient to pay for their feed. There are undoubtedly many cows on North Dakota farms whose annual butter yield does not exceed 140 pounds. Suppose a cow produces an average of sixteen

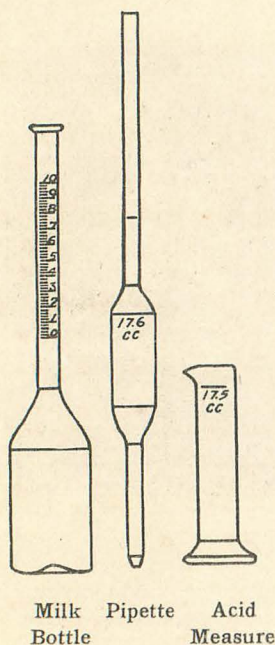
pounds (about eight quarts) of milk a day for eight months out of the year. There are many that do no better. In the two hundred and forty days she will yield 3840 pounds of milk. Now if the milk contains 3% of butter fat there will be 115.2 pounds of fat. Since butter is composed of about 85% of fat and 15% of water, salt, and other solids there can be made from this amount 135 pounds of butter. If butter brings an average price of 22 cents per pound the cow will yield a gross income of \$29.70 just about the actual cost of her feed. The calf, the skim milk, and the manure are usually considered sufficient to pay for labor, housing, interest, and risk.

It would be difficult to say without entering into exact computations whether the owner of such a cow *realizes a gain* of a few cents or *sustains a loss*. At best the animal is little more than a nonentity. She has no place in the world and the sooner she and her kind



are out of it the better. Another animal, however, might yield the same amount of milk or even less and still be profitable. Suppose the milk of the second cow tested 5½% instead of 3% then on the basis of the same amount of milk she would return \$55.66 instead of \$29.70 and as it costs no more to feed her than the first cow it is evident that the owner would realize a good gain yet he might never know it. Should he receive an offer of \$30 for the first cow and \$35 for the second might make the serious mistake of accepting the latter offer or the much more serious mistake of refusing the first offer.

Primrose Tricksey 7236 whose picture was given in the first lesson has a record of 7277 pounds of milk for one year. This milk tested 5.66% giving 525.08 pounds of butter fat. On the basis that butter contains 85% of fat this would make 617.74 pounds of butter worth at 22 cents per pound \$135.90.

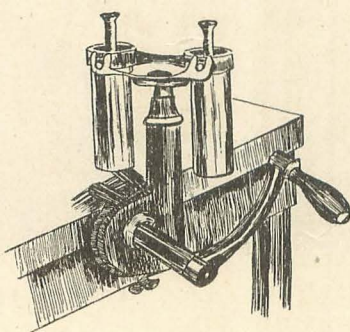


Milk Bottle      Pipette      Acid Measure

Colantha 4's Johanna the great Holstein-Friesian owned by Mr. W. J. Gillett of Rosendale, Wis. is the undisputed champion butter cow of the world. Her best year's record is 998.26 pounds of butterfat or 1174.4 pounds of butter amounting at 22 cents to \$258.37. Compare this with the \$29.70 of the scrub cow. Mr. Gillett, however, is a specialist whose problem is to produce world beaters. This the rank and file of North Dakota farmers cannot do, but there is a problem for them and that is to increase the average yield of the herd. This can be done only by securing and retaining the best individuals and sending all twenty-nine-dollar-a-year cows promptly to the butcher's block. No farmer can afford to keep these "star boarders" as they have been so aptly called. They eat good feed and occupy

good stable room that should be utilized by animals that have the ability to return profits. No cow should be allowed to hold a place in the dairy herd that will not produce say 220 pounds of butterfat each year. To do this she must give twenty pounds of 4% milk a day for nine months or 275 days each year. Two hundred and twenty pounds of fat according to the methods of computation given will make 258 pounds of butter worth \$56.76. This will leave a net profit of about \$25.

It will be noted that the amount of butter produced depends quite as much upon the quality of milks as upon the quantity. The latter is easily determined but the former not so readily. Right here is where the rural school may help to solve the problem. There is but one practical way to determine quality in milk and that is by the use of the Babcock milk tester. The apparatus necessary consists in a two or four bottle



Babcock Tester

tester, milk bottles to correspond, one pipette, one acid measure, and a small quantity of sulphuric acid of **commercial grade**. Chemically pure acid is too strong and will burn the fat while too weak acid will not give results. The entire cost of this outfit will not exceed five or six dollars and if properly and intelligently used will result in greater benefit both educationally and financially to the district than much high-priced dust-covered apparatus often found in schools.

On the day that the milk tests are to be made let different pupils bring milk from the cows which they desire to test. These samples must be taken from the entire milk of the cow at one milking after being thoroly stirred. Stir again before filling the bottle for the tester. Draw the milk up into the pipette till

it is above the 17.6 cc. mark, quickly place the ball of the thumb over the pipette and allow the milk to run down to the mark. Place the lower end of the pipette in the mouth of the bottle and allow the milk to run out. Blow out the last drop. Now fill the acid measure to the line marked 17.5 cc. and pour this into the bottle. Take the bottle in the hand and stir by describing a small circle on the table as you would with a pen. The contents will at first turn brown and finally black. Next place the bottles in the tester and whirl for five minutes giving the number of revolutions per minute indicated on the crank of the machine. Remove the bottles and again using the pipette fill with hot water to the lower part of the neck, now replace in the machine and whirl for one minute. Again remove and add hot water till the contents comes well up into the graduated portion, say to the line marked 8. Now place in the machine for a final whirling of one minute. Remove and read. Reckon from the very lowest portion of fat to the very highest.

The farmer's son may have milked the old brindle cow on many a cold winter morning and sultry summer evening, may have enjoyed more than once a cup of her milk at meal time or been delighted with a portion of its cream on a dish of home grown strawberries, yet he has never known the real amount of such value till now. As he stands with the tester in his hand he has before him the very life secret of the animal. He has forced her to make a clean breast of the whole matter and can now easily determine whether she shall retain her place in the pasture and farm yard or give way to another more competent.

#### To Superintendents and Teachers:

The apparatus described in the foregoing lesson may be secured from any reputable creamery supply house at about the cost indicated. I might suggest The Creamery Package Manufacturing Co. of Minneapolis, Minn. I am confident that if the teacher will secure a Babcock tester and actually make use of it, a most valuable object lesson to both school and community will be given and that the cause of agricultural education will be signally advanced. In this way the teacher and her pupils can help to solve a very practical problem, perform a great economic service in the community, and at the same time study subject matter of greatest interest and importance from an educational standpoint. Such studies will unite the interest of pupils, teachers, and patrons in an important problem in country life and will naturally lead up to and solve other practical problems. The relation of the school to the real things of life can thus be established.



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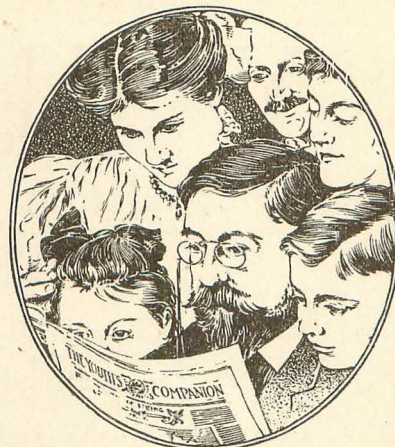
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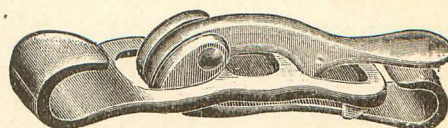
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